NPL-U29-2-6-R6

HRS DOCUMENTATION RECORD

REVIEW COVER SHEET

Name of Site: Garland Creosoting

CONTACT PERSONS

Site Investigation:	Brenda Nixon-Cook, EPA Region 6 (Name)	(214) 665-7436 (Telephone)
Documentation Record:	Brenda Nixon-Cook, EPA Region 6 (Name)	(214) 665-7436 (Telephone)

Pathways, Components, or Threats Not Evaluated

1) Ground Water Pathway: The ground water pathway has not been scored because ground water targets have not been identified. Based on available information, evaluation of this pathway would not significantly affect the overall site score (Ref. 1, Sec. 2.2.3). However, it should be noted that ground water contamination has been identified beneath the site and a two-phase ground water creosote recovery system has been in operation at the site some time after June 1990 (Ref. 6, p. 21). The exact date the ground water recovery system began operating could not be determined. Free-phase product, believed to be creosote, was identified in five wells onsite (MW-2, MW-3S, MW-5, MW-6, and MW-8), at thicknesses up to 0.3 foot, in September 1992 (Ref. 25, pp. 5-7).

   From the period of January 1993 through June 1993, the ground water recovery system has recovered up to 250 gallons of creosote per month from the Queen City Aquifer (Ref. 3, p. 2; Ref. 26, p. 4). During the April 1993 ground water sampling event naphthalene, phenol, and chlorophenol were detected in monitoring wells MW-8 and MW-10 (Ref. 26, pp. 2, 3). During the May 1994 ground water sampling event naphthalene, dibenzofuran, fluorene, and phenanthrene were detected in monitoring well MW-8D (Ref. 3, p. 3). The local shallow ground water flow direction is to the southwest, toward the unnamed intermittent creek located south of the site (Ref. 3, p. 2).

2) Soil Exposure Pathway: No residents, schools, workers, or daycare centers have been identified on or within 200 feet of any known or potential source of contamination (Ref. 1, Sec. 5.1). Further, since the facility is bankrupt, there are no workers currently on-site. Based on available information, evaluation of this pathway would not significantly affect the overall site score (Ref. 1, Sec. 2.2.3).

3) Air Pathway: An observed release to the air migration pathway has not been documented because there are no analytical data to support a release. Based on available information,

evaluation of the air migration pathway would not significantly affect the overall site score (Ref. 1, Sec. 2.2.3).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
EPA NATIONAL PRIORITIES LIST (NPL) July 1999
OSWER/OERR State, Tribal, and Site Identification Center Washington, DC 20460

GARLAND CREOSOTING
Longview, Texas

The Garland Creosoting site is located in Gregg County, Longview, Texas, and encompasses the approximately 12-acre property formerly used by the Garland Creosoting Company for the manufacture of creosote-treated wood products. Garland Creosoting Company began wood treating operations at the facility in 1960 and filed for Chapter 7 bankruptcy in February 1997. Investigations conducted while the facility was operational and subsequent to its closure indicate that hazardous substances used in the wood treating process have contaminated on-site soil, ground water underlying the site, and nearby surface waters.

Prior to 1985, wastewater generated by the Garland Creosoting facility system was treated and discharged to five surface impoundments to allow evaporation. Bottom sludges created in the surface impoundments are classified as a hazardous waste under the Resource Conservation and Recovery Act (RCRA). Reportedly, the facility discontinued use of the surface impoundments in 1985 and diverted treated wastewater to the City of Longview wastewater collection and treatment system. A sixth surface impoundment was used at the facility to contain wastewater in the event of a spill from the process area or wastewater treatment plant.

In May 1986, Garland Creosoting decided to close the five surface impoundments used as wastewater evaporation ponds. A subsurface investigation indicated that the ground water in the vicinity of the impoundments was contaminated, and 12 ground water monitoring wells were installed. In November 1989, the five surface impoundments were capped, leaving the creosote contaminated sludge and soil in place. In June 1990, the facility was issued a post-closure care permit for the impoundments requiring that Garland Creosoting install, operate, and monitor a ground water recovery system to address the contamination. A ground water collection trench was installed to intercept free creosote product and creosote-contaminated ground water. The trench drained into a sump from which the recovered ground water was pumped to the wastewater treatment system and, following treatment, discharged into the City of Longview system. During operation of the system, the facility reported the presence of free creosote product in some of the monitoring wells and ground water contamination by creosote-related substances.

In May 1997, following Garland Creosoting's bankruptcy filing, TNRCC inspected the facility. The inspection revealed that the ground water treatment system had ceased operation and a dark oily substance was observed flowing downhill from the ground water collection trench sump into an intermittent creek running along the southern border of the site. TNRCC inspectors observed a 1,400-square-foot area of soil saturated with creosote between the sump and the intermittent creek. Stressed vegetation, stained soil, and creosote seeps were noted along the bank of the intermittent creek. Ten 55-gallon drums with labels indicating hazardous wastes were found in an unlocked building. TNRCC initiated an emergency response action in May 1997 to abate ongoing discharges and stabilize the site.

The intermittent creek along which the stressed vegetation, stained soil, and creosote seeps were observed runs downstream approximately ⅓ mile where it meets the Iron Bridge Creek southwest of the site. Approximately 1¾ miles downstream from its confluence with the intermittent creek, Iron Bridge Creek flows into the Sabine River. During a November 1997 TNRCC site visit, seven sediment samples were taken from the intermittent creek and Iron Bridge Creek. Analyses of these samples indicated the presence of polynuclear aromatic hydrocarbons (PAHs) and dibenzofuran, contaminants commonly associated with creosoting processes. PAHs and other creosote-related contaminants were detected in samples collected from the surface impoundments, ground water collection sump, and intermittent creek.

Both Iron Bridge Creek and Sabine River are actively fished for flathead catfish, blue catfish, white bass, channel catfish, crappie, large mouth bass, and spotted bass. According to the Texas Parks and Wildlife Department, these fish are primarily caught for human consumption. In addition, wetlands exist along the banks of Iron Bridge Creek and Sabine River throughout the 15-mile distance considered potentially susceptible to contamination from the site. The paddlefish, a listed endangered species in the State of Texas, inhabits the waters at the confluence of Sabine River and Iron Bridge Creek, and is also considered potentially susceptible to contamination from the site.

[The description of the site (release) is based on information available at the time the site was scored. The description may change as additional information is gathered on the sources and extent of contamination. See 56 FR 5600, February 11, 1991, or subsequent FR notices.]

HRS DOCUMENTATION RECORD

Name of Site:	Garland Creosoting
Site Spill Identifier No.:	06GB
EPA Region:	6
Date Prepared:	10 May 1999
Street Address of Site:	3915 Garland Road, Longview, Texas
County and State:	Gregg County, Texas
General Location in the State:	The site is located in the east Texas town of Longview, approximately 80 miles south of the Texas/Oklahoma border and 40 miles west of the Texas/Louisiana border.
Topographic Map:	Lakeport Quadrangle, Texas (7.5-minute topographic series map).

Latitude: 32°26'32.18" (Ref. 15, p. 1). Longitude: 94°42'39.25" (Ref. 15, p. 1)

	Scores
Air Pathway	Not Scored
Ground Water Pathway	Not Scored
Soil Exposure Pathway	Not Scored
Surface Water Pathway	98.19
HRS SITE SCORE	**49.10**

NOTES TO THE READER

1. The following rules were used when citing references in this HRS documentation record:

   A. Tracking numbers are assigned by the region to every page of every reference. The tracking number consists of the reference numbers followed by the page number within that reference. A tracking number has a two-digit number followed by the sequential number (e.g., 040001, 040002).

   B. If the reference has an original page number that page number was cited.

   C. If the reference cited has no original page number or the pagination is not complete; then the designated tracking number was cited.

   D. Analytical data are referenced by tracking numbers only.

2. Hazardous substances are listed by the names used in the *Superfund Chemical Data Matrix* (SCDM) (Ref. 2).

3. Attachment A of this documentation record consists of the following figures:

   Figure A-1 — Site Location Map
   Figure A-2 — Site Area Map
   Figure A-3 — Sample Location Map
   Figure A-4 — Surface Water Pathway Map
   Figure A-5 — Wetlands Frontage Map

REFERENCES CITED

1. 40 CFR Part 300, Hazard Ranking System (HRS); Final Rule, 14 December 1990. Volume 55, No. 241.

2. U.S. Environmental Protection Agency, 1996. Superfund Chemical Data Matrix (SCDM). June 1996.

3. Jones and Neuse, Inc. 1995. Letter to Mr. M. Hibbs, Manager of Permits Section/Hazardous and Solid Waste Division, TNRCC. 17 January 1995. Total Pages: 14.

4. Texas Natural Resource Conservation Commission (TNRCC). 1997. Preliminary Hazard Assessment for the Garland Creosoting Site. 29 December 1997. Total Pages: 25.

5. Texas Water Commission (TWC). Garland Creosoting Company Post-Closure Permit Application. Total Pages: 1.

6. TNRCC. 1997. Permit Compliance Checklist for the Garland Creosoting Company. 13 May 1997 through 23 May 1997. Total Pages: 27.

7. Jones and Neuse, Inc. Surface Impoundment Closure Report (excerpts). Total Pages: 4.

8. TNRCC. 1997. Interoffice Memorandum to the Garland Creosoting Files regarding the 13 May 1997 TNRCC Site Inspection. 14 May 1997. Total Pages: 2.

9. TNRCC. 1997. Interoffice Memorandum to S. Meadours regarding Garland Creosoting Company's Closure Permit and Compliance Plan. 1 July 1997. Total Pages: 6.

10. Ana-Lab, Corp. 1997. Analytical Reports for PS1 (Pond sample) and SSI (sump sample) and associated Quality Assurance/Quality Control (QA/QC) Reports. June 1997. Total Pages: 8.

11. TNRCC. 1997. Field Logbook Notes for the sediment sampling investigation conducted at the Garland Creosoting Site. 24 November 1997. Total Pages: 4.

12. U.S. Environmental Protection Agency (USEPA). "Presumptive Remedies for Soils, Sediments, and Sludges at Wood Treater Sites (excerpts)." Directive: 9200.5-162. Total Pages: 9.

13. TNRCC. 1997. Garland Creosoting Emergency Response Request Addendum. 30 May 1997. Total Pages: 2.

14. TWC. 1990. Compliance Plan No. CP-50297 issued to Garland Creosoting Company. 28 June 1990. Total Pages: 23.

15. U. S. Geological Survey (USGS) . 1983. Lakeport, Texas Quadrangle (7.5-minute topographic series map). Total Pages: 1.

16. U.S. Department of the Interior. 1980. National Wetlands Inventory (NWI) series map. Lakeport, Texas Quadrangle. Total Pages: 1.

17. U.S. EPA. 1992. Hazard Ranking System Guidance Manual (Excerpts). November 1992. Total Pages: 7.

18. Environmental Laboratory Services, 1997. Analytical Reports for samples 2920 through 2926 and associated QA/QC Reports. November and December 1997. Total Pages: 268.

19. McGuire, K. WESTON. 1999. Personal Communication with Mike Ryan, Conservation Scientist VI, Texas Parks and Wildlife Department. 3 February 1999. Total Pages: 1.

20. McGuire, K. WESTON. 1999. Personal Communication with Mike Ryan, Conservation Scientist VI, Texas Parks and Wildlife Department. 4 February 1999. Total Pages: 1.

21. Texas Parks and Wildlife Department. 1996. Texas Threatened and Endangered Species. February 1996. http://www.tpwd.state.tx.us/nature/endang/endang.htm. Total Pages: 7.

22. TNRCC. 1994. Notice of Registration for the Garland Creosoting Company Site. 21 October 1994. Total Pages: 6.

23. WESTON. 1999. Data Quality Assessment for samples analyzed by Ana-Lab, Corp. May 1999. Total Pages: 1.

24. WESTON. 1999. Data Quality Assessment for samples analyzed by Environmental Laboratory Services. May 1999. Total Pages: 1.

25. Jones and Neuse, Inc. 1992. Ground-Water Quality Assessment Plan for the Garland Creosoting Company (excerpts). November 1992. Total Pages: 7.

26. Jones and Neuse, Inc. 1994. Letter to Mr. M. Hibbs, Manager of Permits Section/Hazardous and Solid Waste Division, TNRCC (excerpts). 25 January 1994. Total Pages: 5.

27. USGS.1999. National Water Information for the Sabine River, Longview, Texas. January 1999. http://tx.usgs.gov. Total Pages: 6.

28. Johnson, A. WESTON. 1999. Record of Communication with Mr. Craig Giggleman, Environmental Contaminant Specialist, U.S. Fish and Wildlife Service. 29 June 1999. Total Pages: 1.

29. Johnson, A. WESTON. 1999. Record of Communication with Mr. Gary Hazelwood, TNRCC. 30 June 1999. Total Pages: 1.

SITE SUMMARY

The Garland Creosoting site is located in Longview, Gregg County, Texas (Ref. 4, p. 1). The site is approximately 12 acres in size and is the location of a creosote products manufacturer. The Garland Creosoting Company began operations in 1960 and manufactured creosote-treated wood products (Ref. 4, p. 2). The creosoting process produced K001 creosote waste, which is a listed hazardous waste (Ref. 5, p. 1; Ref. 22, p. 2).

Waste management units at the facility included: six surface impoundments, a flocculation tank, primary and secondary settling tanks, a wastewater treatment tank, a creosote tank, and a creosote sump (Ref. 22, pp. 2-6). The capacity of the surface impoundments range from approximately 1,000 cubic yards to 1,500 cubic yards (Ref. 22, p. 6). The primary and secondary settling tanks each have a capacity of 12,000 gallons (Ref. 22, p. 4). The capacities of the remaining waste management units are not known. The layout of the site is depicted on Figure A-3 of Attachment A.

Five of the six surface impoundments (2, 3, 4, 5, and 6) were used for the evaporation of wood preserving wastewater. These impoundments contained K001 bottom sediment sludges from the treatment of wastewater. Reportedly, the surface impoundments have not received wastes since 1985 (Ref. 5, p . 1). The sixth surface impoundment (1) was used as containment in the event of a spill from the process area and wastewater treatment plant (Ref. 4, p. 3). The surface impoundments are located near the western boundary of the facility (Ref. 4, p. 22).

The Garland Creosoting Company implemented closure proceedings for five of the surface impoundments (2, 3, 4, 5, and 6). However, a subsurface investigation indicated that a release had occurred from the surface impoundments resulting in ground water contamination. Due to this discovery, twelve ground water monitoring wells were installed onsite (Ref. 6, p. 21). Free-phase product, believed to be creosote, has been identified in five of the wells at thicknesses up to 0.3 feet (Ref. 25, pp. 5-7). Semivolatile organic constituents identified in the ground water include naphthalene, dibenzofuran, fluorene, phenanthrene, phenol, and chlorophenol (Ref. 3, pp. 2, 3, 12; Ref. 26, p. 2).

With the existence of the ground water contamination, it was not possible to clean-close the surface impoundments as storage units. Therefore, surface impoundments 2, 3, 4, 5, and 6 were closed as landfills under 40 CFR 265.310 and 31 TAC 335.169 (a) (2) in November 1989 (Ref. 7, p. 3; Ref. 6, p. 21). The K001 creosote sludges and contaminated soil residuals were left in the surface impoundments when they were capped (Ref. 7, pp. 1, 3, 4).

On 28 June 1990, Garland Creosoting was issued a permit for post-closure care of the closed surface impoundments (Permit No. HW-50297). A separate corrective action program was implemented under the closure permit to address the ground water contamination. The corrective action was implemented through a Compliance Plan (CP-50297) incorporated into the post-closure permit, which authorized the installation and operation of a ground water recovery and monitoring system (Ref. 6, p. 21).

A ground water recovery trench was installed at the facility along the west side and part of the south side of the closed surface impoundments to intercept the plume of dissolved and free-phase creosote constituents. The recovery trench acts as a french drain, which then gravity drains to a sump located on the southwest side of the surface impoundments. From the period of January 1993 through June 1993, the ground water recovery system has recovered up to 250 gallons of creosote per month (Ref. 3, p. 2; Ref. 26, p. 4). The recovered contaminated ground water is pumped back to the wastewater treatment system for treatment along with the process wastewater prior to discharge to the City of Longview POTW (Ref. 6, p. 21). However, when Garland Creosoting filed for Chapter 7 bankruptcy on 18 February 1997, the ground water treatment system was shut down (Ref. 6, p. 4).

During a 13 May 1997 inspection conducted by the Texas Natural Resource Conservation Commission (TNRCC), the ground water treatment system was not in operation. A dark oily discharge was observed coming from the recovery trench sump located in the western portion of the site. The dark oily discharge flowed down slope into the unnamed intermittent creek (Ref. 6, p. 15). The recovery sump is located approximately 60 feet north of the intermittent creek, which flows through the southwestern corner of the site (Ref. 8, p. 1).

Water covering the floor of the process building was also observed during this inspection. The process building is located in the northwest portion of the site. The water was flowing out of the building, through the wastewater treatment plant and surface impoundment 1, and toward the intermittent creek. The TNRCC inspectors were not able to determine the source of the water, but were concerned that it could be facility wastewater which is a listed hazardous waste (F034) (Ref. 6, p. 15). Dark staining was observed on the ground in several locations and stressed vegetation was observed in locations downgradient of surface impoundment 1 and along the onsite portion of the drainage pathway (Ref. 8, p. 1).

Additionally, ten 55-gallon drums of hazardous waste labeled "K001" and dated 15 November 1996 were observed onsite. The drums were located in an unsecured storage building behind the facility office. The drums have been in storage greater than 90 days, which exceeds the accumulation time for a Large Quantity Generator (Ref. 6, pp. 4, 16).

As of 23 May 1997, the TNRCC had requested a State-Led Emergency Response Effort be initiated to abate the ongoing discharges and stabilize the site. Code 3, Inc., Environmental Services began an emergency response action on 30 May 1997. Code 3, Inc., began pumping the recovered ground water from the sump into frac tanks (Ref. 9, p. 3). Code 3, Inc., also collected limited samples on 2 June 1997: one waste sample from surface impoundment 1 and one liquid sample of the ground water in the sump (Ref. 23, p. 1; Ref. 10, p. 1). This limited sampling data indicated the presence of several polyaromatic hydrocarbons (PAHs), halogenated phenols, and other organic compounds in the surface impoundment and/or ground water, including: acenaphthene, 2,4-dimethylphenol, fluorene (SS-1 only), phenanthrene, phenol, cresols, and naphthalene (PS-1 only) (Ref. 10, pp. 2-4).

The TNRCC conducted a sediment sampling investigation in November 1997, in which seven sediment samples were collected to better define and characterize the extent of contamination.

Sediment samples were collected onsite and from surface waters draining the site (Ref. 11, pp. 1-5). Contamination by PAHs, halogenated phenols, and other organic compounds was identified in the samples collected onsite and in the surface waters draining the site (Ref. 10, pp. 1-8; Ref. 18, pp. 1-51).

Generally, wood at creosoting sites is treated in cylinders, under pressure, with one or a combination of the following preservatives: pentachlorophenol in petroleum or other solvents; creosote in petroleum or other solvents; or an aqueous solution of copper, chromium, and arsenic. Oil-based processes, such as with creosote in petroleum, produce sludge wastes and significant quantities of process wastewater (Ref. 12, pp. 8-9). Hazardous substances commonly found at creosote facilities include dioxins/furans, halogenated phenols, simple non-halogenated aromatics, PAHs, and other polar organic compounds (Ref. 12, p. 9). Various combinations of these substances were identified in source samples and characterization samples collected on and off site.

Additional site conditions, previously not recognized by the TNRCC, were observed during a 30 May 1997 site visit, when the Emergency Response Action was being initiated. An area of soil saturated with creosote compounds was observed from the sump to the edge of the intermittent creek. The area of saturated soil was approximately 1,400 square feet in size. Active creosote seeps were also noted for approximately 100 yards along the banks of the intermittent creek (Ref. 13, p. 1).

WORKSHEET FOR COMPUTING HRS SITE SCORE

		S	S^2
1.	Ground Water Migration Pathway Score (Sgw) (from Table 3-1, line 13)	NS	NS
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	98.19	9641.28
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	NS	NS
2c.	Surface Water Migration Pathway Score (Ssw) Enter the larger of lines 2a and 2b as the pathway score.	98.19	9641.28
3.	Soil Exposure Pathway Score (Ss) (from Table 5-1, line 22)	NS	NS
4.	Air Migration Pathway Score (Sa) (from Table 6-1, line 12)	NS	NS
5.	Total of $Sgw^2 + Ssw^2 + Ss^2 + Sa^2$	---	9641.28
6.	HRS Site Score: Divide the value on line 5 by 4 and take the square root.	49.10	

Notes:

S Score
S^2 Score squared
NS Not scored

Tables 3-1, 4-1, 4-25, 5-1, and 6-1 refer to scoresheets presented in the HRS Rule (Reference 1). Table 4-1 is reproduced in the following pages of this documentation record for the convenience of the reader.

SITE NAME: GARLAND CREOSOTING SITE SITE SCORE: 49.10

TABLE 4-1[c]

SURFACE WATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors	Maximum Value	Value Assigned
HUMAN FOOD CHAIN THREAT		
Likelihood of Release:		
14. Likelihood of Release	550	550
Waste Characteristics:		
15. Toxicity/Persistence/Bioaccumulation	(a)	5×10^8
16. Hazardous Waste Quantity	(a)	100
17. Waste Characteristics	1,000	320
Targets:		
18. Food Chain Individual	50	45
19. Population		
19a. Level I Concentrations	(b)	0
19b. Level II Concentrations	(b)	0.03
19c. Potential Human Food Chain Contamination	(b)	NS
19d. Population (lines 19a + 19b + 19c)	(b)	0.03
20. Targets (lines 18 + 19d)	(b)	45.03
Human Food Chain Threat Score:		
21. Human Food Chain Threat Score ([lines 14 x 17 x 20]/82,500, subject to a max. of 100)	100	96.06
ENVIRONMENTAL THREAT		
Likelihood of Release:		
22. Likelihood of Release (same value as lines 5 and 14)	550	550
Waste Characteristics:		
23. Ecosystem Toxicity/Persistence/Bioaccumulation	(a)	5×10^8
24. Hazardous Waste Quantity	(a)	100
25. Waste Characteristics	1,000	320

TABLE 4-1[c]
SURFACE WATER MIGRATION PATHWAY SCORESHEET
(Continued)

Factor Categories and Factors	Maximum Value	Value Assigned
Targets:		
26. Sensitive Environments		
26a. Level I Concentrations	(b)	0
26b. Level II Concentrations	(b)	0
26c. Potential Contamination	(b)	1
26d. Sensitive Environments (lines 26a + 26b + 26c)	(b)	1
27. Targets (value from line 26d)	(b)	1
Environmental Threat Score:		
28. Environmental Threat Score ([lines 22 x 25 x 27]/82,500; subject to a maximum of 60)	60	2.13
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED		
29. Watershed Score (lines 13 + 21 + 28, subject to a maximum of 100)	100	98.19
30. Component Score (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100	98.19

Notes:

NS Not Scored

Notes: (continued)

(a) Maximum value applies to Waste Characteristics Category
(b) Maximum value not applicable
c Table 4-1 refers to scoresheets presented in the HRS Rule (Reference 1).

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

2.2.1 Source Identification

Number of the source: 1

Name and description of the source: Surface Impoundments (1 through 6) and Sump

Six surface impoundments are located in the western portion of the site (Ref. 14, p. 19). Five of the six surface impoundments (2, 3, 4, 5, and 6) were used for the evaporation of wood preserving wastewater. These impoundments contained K001 creosote sludges, which is a listed hazardous waste, from the treatment of wastewater (Ref. 5, p. 1). The remaining surface impoundment (1) was used as a containment pond in the event of a spill from the process area and wastewater treatment plant (Ref. 4, p. 3).

Records having measurements of the surface impoundments were not available, however, estimates of each impoundment's size were calculated by measuring the length and the width of each impoundment from a scaled map of the site (Ref. 14, p. 18).

Surface impoundment 1 was approximately 4,550 square feet in size. Surface impoundment 2 was approximately 7,000 square feet in size and had a capacity of 1,037 cubic yards. Surface impoundment 3 was approximately 8,000 square feet in size and had a capacity of 1,350 cubic yards. Surface impoundment 4 was approximately 9,000 square feet in size and had a capacity of 1,575 cubic yards. Surface impoundment 5 was approximately 8,100 square feet in size and had a capacity of 1,133 cubic yards. Surface impoundment 6 was approximately 7,350 square feet in size and had a capacity of 1,467 cubic yards (Ref. 5, p. 1; Ref. 14, p. 18).

Surface impoundments 2, 3, 4, 5, and 6 were closed as landfills in November 1989 (Ref. 6, p. 21). The K001 creosote sludges and contaminated soils residue remained in these surface impoundments prior to when they were capped (Ref. 7, pp. 1, 3, 4).

Additionally, a sump that is part of a ground water recovery system is located immediately southwest of the surface impoundments. The sump is used to recover and treat ground water that has been contaminated due to a release from the surface impoundments (Ref. 6, p. 15). A dark oily discharge was observed flowing from the sump down slope into the portion of the unnamed intermittent creek that is located onsite. (Ref. 6, p. 15; Ref. 8, p. 1).

The ground water recovery system became non-operational when the facility went bankrupt. Contaminated ground water accumulated in the sump and no containment features have been identified to prevent the contaminated ground water from overflowing and discharging into the intermittent creek (Ref. 6, p. 23).

Therefore, surface impoundments 1 through 6 and the sump will be aggregated and evaluated as the source type "Surface Impoundment." These sources have been aggregated because they affect the same surface water pathway targets, have similar waste characteristics and containment features, and lie in the same watershed.

Containment:

Gas release to air: The air migration pathway was not evaluated; therefore, gas containment was not evaluated.

Particulate release to air: The air migration pathway was not evaluated; therefore, particulate containment was not evaluated.

Release to ground water: The ground water migration pathway was not evaluated; therefore, ground water containment was not evaluated.

Release via overland migration and/or flood: During a 13 May 1997 TNRCC inspection, a dark oily discharge was observed flowing from the recovery trench sump downgradient towards the intermittent creek. The recovery trench sump is used to recover and treat ground water that has been contaminated due to a release from the surface impoundments (Ref. 6, p. 15). The sump is located approximately 60 feet north of the intermittent creek, which flows through the southwestern corner of the site (Ref. 8, p. 1).

The floor of the process building, located in the northwest portion of the site, was partially covered with water. The water was flowing out of the building, through the wastewater treatment plant and surface impoundment 1, and towards the intermittent creek. The TNRCC inspectors were not able to determine the source of the water, but were concerned that it could be facility wastewater which is a listed hazardous waste (F034) (Ref. 6, p. 15). Dark staining was noted on the ground in several locations. Severely stressed vegetation was observed in locations downgradient from the surface impoundment and along the drainage pathway (Ref. 8, p. 1).

During a 30 May 1997 TNRCC site visit, an area of soil saturated with creosote compounds was observed from the sump to the edge of the intermittent creek. The area of saturated soil was approximately 1,400 square feet in size. Active creosote seeps were also noted for approximately 100 yards along the banks of the intermittent creek (Ref. 13, p. 1).

The area of the site in which the surface impoundments and sump are located is not bermed to prevent contaminated media from migrating into the surface water drainage pathway onsite or into the intermittent creek that flows through the southwestern corner of the site. Neither the surface impoundments or sump is lined and run-on/runoff controls have not been identified. Further, the surface impoundments are known to still contain K001 creosote waste, which is a listed hazardous waste (Ref. 5, p. 1; Ref. 22, p. 2). Thus, evidence of hazardous substance migration from a source area has been established. As such, a containment factor value of 10 has been assigned to Source 1 (Ref. 1, Table 4-2).

2.2.2 Hazardous Substances Associated with a Source

During the creosote wood-treating process, K001 wastes and sludges were produced. The surface impoundments and the sump (Source 1) are known to have contained or been in contact with creosote-related substances. The surface impoundments contained K001 bottom sediments sludges from the treatment of the wood preserving wastewater (Ref. 5, p. 1). The sump was used to recover and treat ground water contaminated by creosote released from the surface impoundments (Ref. 3, pp. 3, 12; Ref. 6, p. 21).

Therefore, summarized in the following table is analytical evidence of contamination associated with Source 1 in samples collected from the source(s) at the site. On 2 June 1997, a contractor under the direction of the TNRCC collected one waste sample from surface impoundment 1 (PS1) and one liquid sample from water that had accumulated in the recovery sump (SS1) (Ref. 23, p. 1). These samples were collected during a State-Led Emergency Response Action being conducted at the site to stabilize discharges from the site and abate the release of creosote constituents from the surface impoundments onsite (Ref. 10, p. 1).

The maximum concentration of each of the CERCLA-eligible substances detected in the source samples has been presented and used to characterize the source (Ref. 1, Sec. 2.2.3). These hazardous substances were present in concentrations greater than the corresponding detection limit (Ref. 10, pp. 1-8). Detection limits were used for comparison purposes as these samples were not analyzed through the EPA Contract Laboratory Program (CLP). Sample locations are illustrated on Figure A-3 of Attachment A.

HAZARDOUS SUBSTANCES ASSOCIATED WITH A SOURCE

ANALYTE	DATE	SAMPLE ID	CONCENTRATION (DL) (µg/L)	REFERENCES
2-4 Dimethylphenol	06/02/97	PS1	110 (100)	Ref. 10, pp. 1, 2, 4; Ref. 23, p. 1
		SS1	630 (100)	
Acenaphthene	06/02/97	SS1	310 (100)	Ref. 10, pp. 1, 2; Ref. 23, p. 1
Fluorene	06/02/97	SS1	130 (100)	Ref. 10, pp. 1, 2; Ref. 23, p. 1
Phenanthrene	06/02/97	SS1	150 (100)	Ref. 10, pp. 1, 3; Ref. 23, p. 1
Naphthalene	06/02/97	PS1	1400 (100)	Ref. 10, pp. 1, 4; Ref. 23, p. 1
Phenol	06/02/97	PS1	340 (100)	Ref. 10, pp. 1, 3, 4; Ref. 23, p. 1
		SS1	1,400 (100)	
Cresols	06/02/97	PS1	820 (200)	Ref. 10, pp. 1, 2, 4; Ref. 23, p. 1
		SS1	3,600 (200)	

Because the site was a creosote wood processing/treater site and K001 creosote sludges have been identified at the site, additional hazardous substances associated with the creosoting process have also been presented in the table below. While the presence of such substances has not been directly detected in sources at the site, the affiliation of such substances with creosoting facilities has been documented (Ref. 12, pp. 8-9).

Therefore, any of these constituents whose presence has been documented in contaminated sediments and/or ground water will be used to evaluate this site.

HAZARDOUS SUBSTANCES COMMONLY FOUND AT CREOSOTE FACILITIES

Dioxins/furans: • Dibenzo-p-dioxins • Dibenzofurans • Furan **Halogenated phenols:** • Pentachlorophenol • Tetrachlorophenol **Simple non-halogenated aromatics:** • Benzene • Toluene • Ethylbenzene • Xylene **Polynuclear aromatic hydrocarbons (PAHs):** • 2-Methylnaphthalene • Chrysene • Acenaphthene • Fluoranthene	**Polynuclear aromatic hydrocarbons (continued):** • Acenaphthylene • Fluorene • Anthracene • Indeno(1,2,3-cd)pyrene • Benzo(a)anthracene • Naphthalene • Benzo(a)pyrene • Phenanthrene • Benzo(b)fluoranthene • Pyrene • Benzo(k)fluoranthene **Other polar organic compounds:** • 2,4-Dimethylphenol • 2-Methylphenol • 4-Methylphenol • Benzoic acid • Di-n-octyl phthalate • N-nitrosodiphenylamine

Source: Ref. 12, pp. 8-9.

2.2.3 Identify Hazardous Substances Available to a Pathway

During a post-closure investigation conducted by the TNRCC on 13 May 1997, a dark oily discharge was observed flowing from the recovery sump downgradient to the intermittent creek (Ref. 6, p. 15). The recovery sump is located approximately 60 feet north of the intermittent creek (Ref. 8, p. 1). Water flowing from the process building was also observed during this inspection. The water flowed through the wastewater treatment plant and surface impoundment 1, and continued towards the intermittent creek (Ref. 6, p. 15). The intermittent creek flows through the southwest corner of the site (Ref. 4, p. 22).

Further, during a 30 May 1997 site visit by the TNRCC, an area of soil saturated with creosote compounds was observed. The area was approximately 1,400 square feet in size and measured approximately 70 feet by 20 feet. Active creosote seeps were also observed for approximately 100 yards along the banks of the intermittent creek (Ref. 13, p. 1).

As such, creosote compounds have migrated from the site and are entering the surface water pathway. Hazardous substances known to be associated with creosote compounds have been documented to be present in sediment samples collected from the surface water pathway based on sampling data (Ref. 18, pp. 1-3, 5, 7, 10, 12-14, 24, 26-28, 31, 33-35, 38, 40-42; Ref. 24, p. 1). These hazardous substances are present in concentrations significantly above site-specific designated background levels. Hazardous substances available to the pathway include those associated with a source with a containment factor value greater than zero and those that meet the criteria for an observed release to surface water (Ref. 1, sec. 2.2.3). As such, the hazardous substances listed on page 18 and 19 and in Table II on page 33 of this documentation record will be used to evaluate the Garland Creosoting Site as their presence has been documented in contaminated sediments at the site.

2.3 LIKELIHOOD OF RELEASE

Refer to Subsection 4.1.3.2 of this documentation record for specific information related to sediment samples that meet the criteria for an observed release.

2.4 WASTE CHARACTERISTICS

Specific factors related to waste characteristics associated with Source 1, Surface Impoundments and Sump, are presented in the subsections below.

2.4.1 Selection of Substance Potentially Posing Greatest Hazard

Presented in the table below are the hazardous substances associated with Source 1 as well those substances known to be affiliated with creosoting facilities. For the migration pathways (and threats), the selection of the substance that potentially poses the greatest hazard is based on the toxicity factor value combined with its mobility, persistence and/or bioaccumulation potential factor values (Ref. 1, Sec. 2.4.1.2).

SUBSTANCE	TOXICITY*	MOBILITY* (Liquid/Non-Karst	PERSISTENCE* (River)	BIOACCUMULATION*	
				FOOD CHAIN (Fresh)	ENVIRON. (Fresh)
Acenaphthene	10	0.01	0.400	500	500
Cresols	100	1	0.400	5	5
2,4-Dimethylphenol	100	1	1	500	500
Fluorene	100	0.01	1	5,000	5,000
Naphthalene	100	1	0.400	500	500
Phenanthrene	----	0.001	1	50	5,000
Phenol	1	1	1	5	5
Dibenzofuran	----	0.001	1	500	500
Furan	1,000	1	0.400	5	5

* Toxicity, mobility, persistence, and bioaccumulation factor values are from SCDM (Ref. 2).

SUBSTANCE	TOXICITY*	MOBILITY* (Liquid/Non-Karst	PERSISTENCE* (River)	BIOACCUMULATION*	
				FOOD CHAIN (Fresh)	ENVIRON. (Fresh)
Pentachlorophenol	100	1	1	500	500
Tetrachlorophenol	100	1	1	500	5,000
Benzene	100	1	0.400	5,000	500
Toluene	10	1	0.400	50	50
Ethylbenzene	10	1	0.400	50	50
2-Methylnaphthalene	----	0.01	0.400	50	50
Chrysene	10	0.01	1	500	5,000
Fluoranthene	100	0.01	1	5,000	500
Acenaphthylene	----	1	0.400	500	500
Anthracene	10	0.01	1	5,000	5,000
Indeno(1,2,3-cd)pyrene	1,000	0.0001	1	50,000	50,000
Benzo(a)anthracene	1,000	0.01	1	50,000	50,000
Benzo(a)pyrene	10,000	0.0001	1	50,000	50,000
Benzo(b)fluoranthene	10,000	0.0001	1	50,000	50,000
Pyrene	100	0.01	1	50	50
Benzo(k)fluoranthene	100	0.0001	1	50,000	50,000
Benzoic acid	1	1	0.400	5	5

* Toxicity, mobility, persistence, and bioaccumulation factor values are from SCDM (Ref. 2).

Benzo(a)pyrene was selected as the hazardous substance potentially posing the greatest hazard because of its high toxicity factor (10,000) combined with its high bioaccumulation factor (50,000) and the fact that its presence has been detected in contaminated sediments at the site (Ref. 1, Sec. 2.4.1.2; Ref. 2; Ref. 18, pp. 1, 2, 24, 26, 31, 33, 38, 40). Further, benzo(a)pyrene is a substance that is commonly associated with creosote-treating facilities and the Garland Creosoting Site is known to have produced K001 creosote waste and sludges that remain onsite (Ref. 5, p. 1; Ref. 12, pp. 8-9).

2.4.2 Hazardous Waste Quantity

2.4.2.1 Source Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity (Tier A) - Not Calculated

The hazardous constituent quantity is not available; therefore, it is not possible to adequately determine a hazardous constituent quantity (Tier A) for Source 1, Surface Impoundments and Sump (Ref. 1, Subsec. 2.4.2.1.1). As a result, the evaluation of hazardous waste quantity proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Subsec. 2.4.2.1.2).

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B) - Not Calculated

The hazardous wastestream quantity is not available; therefore, it is not possible to adequately determine a hazardous wastestream quantity (Tier B) for Source 1, Surface Impoundments and Sump (Ref. 1, Subsec. 2.4.2.1.2). As a result, the evaluation of hazardous wastestream quantity proceeds to the evaluation of Tier C, volume (Ref. 1, Subsec. 2.4.2.1.3).

2.4.2.1.3 Hazardous Waste Quantity (Tier C) - Volume

The volume or hazardous waste quantity is not available; therefore, it is not possible to adequately determine a volume (Tier C) for Source 1, Surface Impoundments and Sump (Ref. 1, Subsec. 2.4.2.1.3). As a result, the evaluation of hazardous wastestream quantity proceeds to the evaluation of Tier D, area (Ref. 1, Subsec. 2.4.2.1.4).

2.4.2.1.4 Hazardous Waste Quantity (Tier D) - Area

The size of the sump is relatively small compared to the surface impoundments and the addition of its area will not significantly affect the overall hazardous waste quantity. Therefore, the size of the sump will not be included in the calculation of the hazardous waste quantity. Records having measurements of the surface impoundments were not available, however, estimations of each surface impoundment's area was calculated by measuring the length and the width of each impoundment on a scaled map of the site (Ref. 14, p. 18).

Calculations:

Surface impoundment 1:	65'	x	70'	=	4,550	square feet.
Surface impoundment 2:	70'	x	100'	=	7,000	square feet.
Surface impoundment 3:	100'	x	80'	=	8,000	square feet.
Surface impoundment 4:	120'	x	75'	=	9,000	square feet.
Surface impoundment 5:	90'	x	90'	=	8,100	square feet.
Surface impoundment 6:	105'	x	70'	=	7,350	square feet.
Total square footage:					44,000	square feet

After the area of each individual surface impoundment was calculated, these areas were added together for a total area of all the surface impoundments. Thus, the approximate area of the combined surface impoundments is 44,000 square feet. According to the HRS Rule, a value from Table 2-5 is assigned based on the size of the source (area in square feet) divided by a factor of 13 (Ref. 1, Subsec. 2.4.2.1.4, Table 2-5). As such, a value of 3,384.6 is assigned for Source 1 based on the total area of the surface impoundments (Ref. 1, Subsec. 2.4.2.1.4, Table 2-5).

Area of Source: 44,000 ft^2
Value Assigned Area (from Table 2-5) (44,000/13): 3,384.6

2.4.2.1.5 Source Hazardous Waste Quantity Value

According to the HRS Rule, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), volume (Tier C), and area (Tier D) should be assigned as the source hazardous waste quantity value (Ref. 1, Subsec. 2.4.2.1.5). As such, Tier D was the only tier evaluated for Source 1 and will be assigned as the source hazardous waste quantity value (Ref. 1, Subsec. 2.4.2.1.5).

Source Hazardous Waste Quantity Value: 3,384.6

2.4.2.2 Calculation of Hazardous Waste Quantity Factor Value

According to the HRS Rule, sum the source hazardous waste quantity values assigned to all sources for the pathway being evaluated and round this sum to the nearest integer, except: if the sum is greater than 0, but less than 1, round it to 1 (Ref. 1, Subsec. 2.4.2.2). There is only one source being evaluated for the surface water pathway (Surface Impoundment). As such, the source hazardous waste quantity value of 3,384.6 was used to assign the hazardous waste quantity factor value per Table 2-6 of the HRS Rule (Ref. 1, Subsec. 2.4.2.2, Table 2-6). Based on Table 2-6 of the HRS Rule, a hazardous waste quantity factor value of 100 was assigned.

Hazardous Waste Quantity Factor Value: 100

POTENTIAL SOURCES NOT EVALUATED

Potential sources identified at the Garland Creosoting Site include an area of contaminated soil and a creosote-processing building. The area of contaminated soil is approximately 1,400 feet in size and was observed to be saturated with creosote during a 30 May 1997 TNRCC site visit (Ref. 13, p. 1). The area of contaminated soil is located from the sump to the edge of the intermittent creek (Ref. 13, p. 11).

The process building is located in the northern portion of the site (Ref. 4, p. 22). During the TNRCC 13 May 1997 site visit, water was observed covering the floor of the process building. The water was flowing out of the building through the wastewater treatment plant and toward the intermittent creek (Ref. 6, p. 15). TNRCC inspectors were not able to determine a source of the water, but were concerned that it could be facility wastewater, which is a listed hazardous waste (F034) (Ref. 6, p. 15).

Although these potential sources may have contributed hazardous substances to the contamination identified in the surface water pathway, they have not been evaluated as part of this HRS documentation record as there is no analytical data available to support the evaluation of these potential sources.

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 General Considerations

NOT SCORED

The ground water pathway was not scored for the Garland Creosoting Site. No drinking water wells have been identified within a 4-mile TDL of the site (Ref. 4, p. 2). As such, evaluation of this pathway would not significantly affect the overall site score.

However, it should be noted that ground water contamination has been identified beneath the site and a two-phase ground water creosote recovery system has been in operation at the site some time after June 1990 (Ref. 6, p. 21). The exact date that the ground water recovery system began operating could not be determined. Free-phase product, believed to be creosote, has been identified in five monitoring wells onsite (MW-2, MW-3S, MW-5, MW-6, MW-8) at thicknesses up to 0.3 feet in September 1992 (Ref. 25, pp. 5-7).

From the period of January 1993 through June 1993, the ground water recovery system has recovered up to 250 gallons per month of creosote from the Queen City Aquifer, further indicating the presence of contaminated ground water beneath the site (Ref. 3, p. 2; Ref. 26, p. 4). During this period, the minimum amount of creosote recovered was 50 gallons and the maximum amount of creosote recovered was 250 gallons per month (Ref. 26, p. 4).

During the April 1993 ground water sampling event naphthalene, phenol, and chlorophenol were detected in monitoring wells MW-8 and MW-10 (Ref. 26, pp. 2, 3). During the May 1994 ground water sampling event naphthalene, dibenzofuran, fluorene, and phenanthrene were detected in monitoring well MW-8D (Ref. 3, p. 3)..

4.0 SURFACE WATER MIGRATION PATHWAY

4.0.1 Migration Components

Overland/Flood Migration to Surface Water

The overland/flood migration to surface water migration component is the only component that has been scored for this site based on the human food chain threat and the environmental threat. As such, the overland/flood migration to surface water migration component score will be assigned as the surface water migration pathway score (Ref. 1, Sec. 4.0.1)

Ground Water to Surface Water Migration

The ground water to surface water migration component has not been scored because an observed release to surface water attributable to the migration of hazardous substances via overland/flood migration has been established. Evaluation of this component of the surface water pathway would not affect the overall site score (Ref. 1, Sec. 4.0.1).

4.0.2 Surface Water Categories

According to the HRS Rule, Section 4.0.2, a river is defined as, "perennially flowing waters from point of origin to the ocean or to coastal tidal waters, whichever comes first, and wetlands contiguous to these flowing waters" (Ref. 1, Sec. 4.0.2). An unnamed intermittent creek flows through the southwest corner of the site, as illustrated on Figure A-3 of Attachment A. The intermittent creek flows into Iron Bridge Creek, approximately 0.38 miles southwest of the site (Ref. 15, p. 1). The Iron Bridge Creek flows perennially in a southwesterly direction until its confluence with the Sabine River (Segment 0505) (Ref. 9, p. 1; Ref. 15, p. 1). Further, wetlands are located at the confluence of the intermittent creek and the Iron Bridge Creek and are contiguous to Iron Bridge Creek and the Sabine River (Ref. 16, p. 1).

As such, the Iron Bridge Creek, the Sabine River, and any wetlands contiguous to both the Iron Bridge Creek and the Sabine River will be evaluated as eligible surface water bodies for HRS scoring purposes (Ref. 1, Sec. 4.0.2).

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

4.1.1 General Considerations

4.1.1.1 Hazardous Substance Migration Path for Overland/Flood Migration Component

Overland Segment

The overland segment is defined as, " the portion of the hazardous substance migration path from a source to a surface water body" (Ref. 17, p. 3). The overland segment is used to evaluate potential to release to surface water and establish the Probable Point of Entry (PPE). The PPE is the point at which the overland segment of a hazardous substance migration path intersects with perennially flowing surface water (Ref. 17, p. 3). However, a wetland contiguous to river, lake, or coastal tidal water is considered to be surface water and the PPE is where the overland segment meets the wetland (Ref. 17, p. 4).

Based on available information, runoff from Source 1 flows overland through the site, in a southerly direction, towards the intermittent creek. The intermittent creek flows through the southwestern corner of the site. The overland segment is illustrated on Figure A-3 of Attachment A.

Sediment sample SE-04 was collected from the intermittent creek, immediately south of the sump (Ref. 18, pp. 1, 2, 24). Sediment sample SE-05 was collected on site, between the sump and the intermittent creek (Ref. 18, pp. 1, 2, 31). A duplicate sediment sample (SE-06) was also collected from the same location as sample SE-05 (Ref. 18, pp. 1, 2, 38). These sediment samples indicate migration of contaminants from the source to the intermittent creek as shown in the table below and on Figure A-3 of Attachment A.

SAMPLE ID	DATE	DEPTH	HAZARDOUS SUBSTANCE	CONC. (PQL) (µg/kg)	REFERENCES
SE-04	11/24/97	0 - 12"	Acenaphthene	140,000 (6500)	Ref. 18, pp. 1, 2, 24, 26; Ref. 11, p. 3; Ref. 24, p. 1
SE-04	11/24/97	0 - 12"	Anthracene	48,000 (6500)	Ref. 18, pp. 1, 2, 24, 26; Ref. 11, p. 3; Ref. 24, p. 1
SE-04	11/24/97	0 - 12"	Benzo(b,k)fluoranthene	37,400 (13,000)	Ref. 18, pp. 1, 2, 24, 26; Ref. 11, p. 3; Ref. 24, p. 1
SE-04	11/24/97	0 - 12"	Benzo(a)anthracene	48,000 (6500)	Ref. 18, pp. 1, 2, 24, 26; Ref. 11, p. 3; Ref. 24, p. 1
SE-04	11/24/97	0 - 12"	Benzo(a)pyrene	16,000 (6500)	Ref. 18, pp. 1, 2, 24, 26; Ref. 11, p. 3; Ref. 24, p. 1
SE-04	11/24/97	0 - 12"	Chrysene	46,000 (6500)	Ref. 18, pp. 1, 2, 24, 26; Ref. 11, p. 3; Ref. 24, p. 1
SE-04	11/24/97	0 - 12"	Fluoranthene	180,000 (6500)	Ref. 18, pp. 1, 2, 24, 26; Ref. 11, p. 3; Ref. 24, p. 1
SE-04	11/24/97	0 - 12"	Pyrene	140,000 (6500)	Ref. 18, pp. 1, 2, 24, 28; Ref. 11, p. 3; Ref. 24, p. 1
SE-04	11/24/97	0 - 12"	Dibenzofuran	97,000 (6500)	Ref. 18, pp. 1, 2, 24, 27; Ref. 11, p. 3; Ref. 24, p. 1

SAMPLE ID	DATE	DEPTH	HAZARDOUS SUBSTANCE	CONC. (PQL) (µg/kg)	REFERENCES
SE-04	11/24/97	0 - 12"	Fluorene	120,000 (6500)	Ref. 18, pp. 1, 2, 24, 27; Ref. 11, p. 3; Ref. 24, p. 1
SE-04	11/24/97	0 - 12"	Naphthalene	240,000 (6500)	Ref. 18, pp. 1, 2, 24, 27; Ref. 11, p. 3; Ref. 24, p. 1
SE-04	11/24/97	0 - 12"	Phenanthrene	270,000 (6500)	Ref. 18, pp. 1, 2, 24, 28; Ref. 11, p. 3; Ref. 24, p. 1
SE-05	11/24/97	0 - 12"	Anthracene	1,600 (580)	Ref. 18, pp. 1, 2, 31, 33; Ref. 11, p. 3; Ref. 24, p. 1
SE-05	11/24/97	0 - 12"	Benzo(b,k)fluoranthene	10,000 (1200)	Ref. 18, pp. 1, 2, 31, 33; Ref. 11, p. 3; Ref. 24, p. 1
SE-05	11/24/97	0 - 12"	Benzo(a)anthracene	710 (580)	Ref. 18, pp. 1, 2, 31, 33; Ref. 11, p. 3; Ref. 24, p. 1
SE-05	11/24/97	0 - 12"	Benzo(a)pyrene	3,000 (580)	Ref. 18, pp. 1, 2, 31, 33; Ref. 11, p. 3; Ref. 24, p. 1
SE-05	11/24/97	0 - 12"	Chrysene	1,500 (580)	Ref. 18, pp. 1, 2, 31, 33; Ref. 11, p. 1; Ref. 24, p. 1
SE-05	11/24/97	0 - 12"	Dibenzo(a,h)anthracene	1,200 (580)	Ref. 18, pp. 1, 2, 31, 33; Ref. 11, p. 1; Ref. 24, p. 1
SE-05	11/24/97	0 - 12"	Indenol(1,2,3-cd)pyrene	4,000 (580)	Ref. 18, pp. 1, 2, 31, 34; Ref. 11, p. 1; Ref. 24, p. 1
SE-05	11/24/97	0 - 12"	Pyrene	850 (580)	Ref. 18, pp. 1, 2, 31, 35, Ref. 11, p. 1; Ref. 24, p. 1
SE-05	11/24/97	0 - 12"	Benzo(g,h,i)perylene	3,800 (580)	Ref. 18, pp. 1, 2, 31, 33; Ref. 11, p. 3; Ref. 24, p. 1
SE-06	11/24/97	0 - 12"	Anthracene	1,400 (580)	Ref. 18, pp. 1, 2, 38, 40; Ref. 11, p. 1; Ref. 24, p. 1
SE-06	11/24/97	0 - 12"	Benzo(b,k)fluoranthene	8,300 (1200)	Ref. 18, pp. 1, 2, 38, 40; Ref. 11, p. 1; Ref. 24, p. 1
SE-06	11/24/97	0 - 12"	Benzo(a)anthracene	790 (580)	Ref. 18, pp. 1, 2, 38, 40; Ref. 11, p. 1; Ref. 24, p. 1
SE-06	11/24/97	0 - 12"	Benzo(a)pyrene	2,700 (580)	Ref. 18, pp. 1, 2, 38, 40; Ref. 11, p. 1; Ref. 24, p. 1
SE-06	11/24/97	0 - 12"	Benzo(g,h,i)perylene	3,300(580)	Ref. 18, pp. 1, 2, 38, 40; Ref. 11, p. 1; Ref. 24, p. 1
SE-06	11/24/97	0 - 12"	Chrysene	1,600 (580)	Ref. 18, pp. 1, 2, 38, 40; Ref. 11, p. 1; Ref. 24, p. 1
SE-06	11/24/97	0 - 12"	Dibenzo(a,h)anthracene	1,100 (580)	Ref. 18, pp. 1, 2, 38, 40; Ref. 11, p. 1; Ref. 24, p. 1
SE-06	11/24/97	0 - 12"	Fluoranthene	720 (580)	Ref. 18, pp. 1,2, 38, 40; Ref. 11, p. 3; Ref. 24, p. 1
SE-06	11/24/97	0 - 12"	Indenol(1,2,3-cd)pyrene	3,600 (580)	Ref. 18, pp. 1,2, 38, 41; Ref. 11, p. 3; Ref. 24, p. 1
SE-06	11/24/97	0 - 12"	Pyrene	910 (580)	Ref. 18, pp. 1,2, 38, 42; Ref. 11, p. 3; Ref. 24, p. 1

Sediment sample SE-07 was collected from the intermittent creek, approximately 100 yards upstream of Garland Road (Ref. 18, pp. 1, 2, 45). The laboratory analysis reported no detectable concentrations of the primary contaminants of concern (listed in Table 1 on page 31 and 32 of this document) in the sample (Ref. 18, pp. 2, 45-51).

Based on the Lakeport Quadrangle 7.5-minute topographic series map, the intermittent creek flows approximately 0.38 miles downstream where it enters the Iron Bridge Creek (Ref. 15, p. 1). The PPE for a release of hazardous substances to a perennial surface water body is located at the confluence of the intermittent creek and Iron Bridge Creek (Ref. 15, p.1).

In-Water Segment

The in-water segment is the portion of the hazardous substance migration path from the PPE to the Target Distance Limit (TDL) (Ref. 17, p. 2). A Surface Water Pathway Map is included as Figure A-4 of Attachment A and illustrates each segment of the surface water pathway.

PPE: Confluence of intermittent creek and Iron Bridge Creek

The confluence of the intermittent creek and Iron Bridge Creek is the PPE into a perennial surface water body. The PPE is approximately 0.38 miles downstream of the site (Ref. 15, p. 1).

In-Water Segment 1: Iron Bridge Creek

Iron Bridge Creek flows perennially in a southerly direction towards the Sabine River. Iron Bridge Creek flows for approximately 1.75 stream miles until it enters the Sabine River (Ref. 15, p. 1).

In-Water Segment 2: Sabine River

After approximately 1.75 stream miles, the Iron Bridge Creek flows into the Sabine River (Segment 0505). The Sabine River flows in an easterly direction across the area. The remaining 13.25 stream miles of the 15-mile TDL occur within the Sabine River (Ref. 15, p. 1).

4.1.1.2 Target Distance Limit (TDL)

The TDL defines the maximum distance over which targets are considered in evaluating the site (Ref. 1, Subsec. 4.1.1.2). According to the HRS Rule, if there is an observed release from the site to the surface water in the watershed that is based on sampling, begin measuring the TDL for the watershed at the PPE, and extend the TDL either for 15 miles along the surface water or to the most distant sample point that meets the criteria for an observed release to that watershed, whichever is greater (Ref. 1, Subsec. 4.1.1.2).

An observed release attributable to the site has been documented based on analytical data from sediment samples collected from the site and surface waters adjacent to the site (Ref. 18, pp. 1-51). One hazardous substance migration path and one watershed have been identified for the surface water pathway being evaluated for the Garland Creosoting Site.

The PPE is located at the confluence of the intermittent creek and Iron Bridge Creek, approximately 0.38 miles southwest of the site. Approximately 1.75 miles of the 15-mile TDL are located within the perennially flowing Iron Bridge Creek. Iron Bridge Creek flows into the Sabine River in a general southwesterly direction. The remaining 13.25 miles of the 15-mile TDL occur within the perennially flowing Sabine River (Ref. 15, p. 1).

Fishery targets are located, partially or wholly, either at or between the PPE and sediment sampling points that meet the criteria for an observed release as set forth in Section 2.3 of the HRS Rule (Ref. 1, Sec. 2.3, Table 2-3; Ref. 16, p. 1; Ref. 19, p. 1). As such, these targets will be considered subject to actual contamination per Subsection 4.1.1.2 of the HRS Rule (Ref. 1, Subsec. 4.1.1.2). For further discussion of fishery targets, refer to Subsection 4.1.3 of this documentation record.

4.1.1.3 Evaluation of Overland/Flood Migration Component

The drinking water threat will not be evaluated. The human food chain threat and environmental threat for each watershed will be evaluated for this component based on three factor categories: Likelihood of Release, Waste Characteristics, and Targets per HRS Rule, Subsection 4.1.1.3 (Ref. 1, Subsec. 4.1.1.3).

4.1.2 Drinking Water Threat - Not Evaluated

Drinking water intakes have not been identified within the 15-mile TDL downstream of the site (Ref. 4, pp. 2, 4). Therefore, the drinking water threat for the surface water pathway was not evaluated.

4.1.3 Human Food Chain Threat

4.1.3.1 Human Food Chain Threat-Likelihood of Release

Specific information related to sediment samples that meet the criteria for an observed release for the human food chain threat are presented in the subsections below.

Observed Release

The surface water pathway is the only pathway being evaluated for the Garland Creosoting Site because creosote contamination associated with the site has been released to the surface waters draining the site. An observed release to the surface water pathway was established based on analytical evidence of hazardous substances per HRS Rule, Secs. 2.3 and 4.1.2.1.1. An observed release was established when the concentration of the hazardous substances was significantly greater than the designated site-specific background levels or in concentrations greater than the corresponding detection limits (Ref. 1, Secs. 2.3 and 4.1.2.1.1). Information used to evaluate the surface water pathway is presented in the subsections below.

Direct Observation: Not Applicable

Chemical Analysis:

Background Samples

Sediment samples used to establish designated background levels for substances in the vicinity of the Garland Creosoting Site were based on analytical results from a November 1997 TNRCC investigation. A background sediment sample (SE-03) was collected during this investigation and designated as background (Ref. 4, pp. 20, 25; Ref. 18, pp. 1, 2, 17-23). All sediment samples were collected at a depth of 0 to 12 inches below ground surface (Ref. 29, p. 1). The background location is identified on Figure A-3 and Figure A-4 of Attachment A.

Sediment sample SE-03 was collected approximately 40 yards upstream of the confluence of the intermittent creek and Iron Bridge Creek (Ref. 18, pp. 1-2, 17-23). The laboratory analysis reported no detectable concentrations of the primary contaminants of concern in the sample (Ref. 18, pp. 2, 17-23). Practical Quantitation Limits (PQLs) were used for comparison purposes as the samples were not analyzed through the U.S. Environmental Protection Agency (EPA) Contract Laboratory Program (CLP). Site-specific background levels designated for the Garland Creosoting Site are presented in the table below.

TABLE 1
DESIGNATED SEDIMENT BACKGROUND LEVELS

ANALYTE	CONC. (PQL) (µg/kg)	3 x HIGHEST BACKGROUND CONC.	REFERENCES
Acenaphthene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 19; Ref. 24, p. 1
Anthracene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 19; Ref. 24, p. 1
Benzo(a)anthracene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 19; Ref. 24, p. 1
Benzo(a)pyrene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 19; Ref. 24, p. 1
Benzo(b,k)fluoranthene	ND (1440)	NA	Ref. 18, pp. 1-2, 17, 19; Ref. 24, p. 1
Benzo(g,h,i)perylene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 19; Ref. 24, p. 1
Chrysene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 19; Ref. 24, p. 1
Dibenzofuran	ND (720)	NA	Ref. 18, pp. 1-2, 17, 20; Ref. 24, p. 1
Dibenzo(a,h)anthracene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 19; Ref. 24, p. 1
Fluorene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 20; Ref. 24, p. 1
Fluoranthene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 19; Ref. 24, p. 1
Indenol(1,2,3-cd)pyrene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 20; Ref. 24, p. 1

ANALYTE	CONC. (PQL) (µg/kg)	3 x HIGHEST BACKGROUND CONC.	REFERENCES
Naphthalene	ND (720)	NA	Ref. 18, pp. 1-2,17, 20; Ref. 24, p. 1
Phenanthrene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 21; Ref. 24, p. 1
Pyrene	ND (720)	NA	Ref. 18, pp. 1-2, 17, 21; Ref. 24, p. 1

Note:

ND = Not detected. Concentrations of these analytes were not detected at the reported PQL in sediment samples considered for the development of sediment background levels at the Garland Creosoting Site.

Sediment sample SE-03 is considered to be representative of background conditions within the vicinity of the site as this sample was collected upstream of the PPE within the same surface water migration pathway that is being evaluated for the release samples (See figure A-3). Further, all samples (background and characterization) were collected from similar depths at 0 to 12 inches below ground surface (Ref. 29, p. 1). This location is considered to be outside the influence of contamination at the site. It should be noted that background levels were not established for the Garland Creosoting Site as the laboratory analysis showed no detectable concentrations of these constituents. As such, an observed release will be established when the sample measurement equals or exceeds the detection limit (Ref. 1, Table 2-3). Since the laboratory reported PQLs instead of detection limits, the PQLs will be used for comparison purposes and an observed release will be established when the sample measurement equals or exceeds the PQL.

Release Samples

In November 1997, the TNRCC conducted a Preliminary Hazard Assessment investigation at the Garland Creosoting Site. The objective of the investigation was to further characterize sources and potential contamination at the site. During TNRCC's investigation, seven sediment samples were collected on site and from the intermittent creek and Iron Bridge Creek, both of which drain the site (Ref. 4, pp. 4, 5, 20, 25). All seven sediment samples were collected from a similar depth at 0 to 12 inches below ground surface (Ref. 29, p. 1).

Sediment sample SE-02 was collected at the confluence of the intermittent creek and Iron Bridge Creek (Ref. 18, pp. 1, 2, 10). This is considered to be the PPE that has been established for the site. Sediment sample SE-01 was collected approximately 220 yards downstream of sample location SE-02, within Iron Bridge Creek (Ref. 18, pp. 1-3). Sediment samples SE-04 through SE-06 were collected from the intermittent creek and are discussed in Section 4.1.1 of this HRS documentation record. Specific sediment sample locations are depicted on Figure A-3 and Figure A-4 of Attachment A.

Presented in the table below are sediment sample results used to establish an observed release to the surface water pathway for the Garland Creosoting Site. PQLs will be used for comparison purposes as the analyses were not performed through the EPA CLP.

TABLE II
RELEASE SAMPLES AND CONCENTRATIONS
NOVEMBER 1997

SAMPLE ID	DATE	DEPTH	HAZARDOUS SUBSTANCE	CONC. (PQL) (µg/kg)	REFERENCES
SE-01	11/24/97	0 - 12"	Fluoranthene	1300 (730)	Ref. 18, pp. 1-3, 5; Ref. 11, p. 1; Ref. 24, p. 1
SE-01	11/24/97	0 - 12"	Pyrene	900 (730)	Ref. 18, pp. 1-3, 7; Ref. 11, p. 1; Ref. 24, p. 1
SE-02	11/24/97	0 - 12"	Acenaphthene	23,000 (4100)	Ref. 18, pp. 1, 2, 10, 12; Ref. 11, p. 1; Ref. 24, p. 1
SE-02	11/24/97	0 - 12"	Anthracene	10,000 (4100)	Ref. 18, pp. 1, 2, 10, 12; Ref. 11, p. 1; Ref. 24, p. 1
SE-02	11/24/97	0 - 12"	Benzo(a)anthracene	22,000 (4100)	Ref. 18, pp. 1, 2, 10, 12; Ref. 11, p. 1; Ref. 24, p. 1
SE-02	11/24/97	0 - 12"	Benzo(b,k)fluoranthene	19,300 (8200)	Ref. 18, pp. 1, 2, 10, 12; Ref. 11, p. 1; Ref. 24, p. 1
SE-02	11/24/97	0 - 12"	Benzo(a)pyrene	6,600 (4100)	Ref. 18, pp. 1, 2, 10, 12; Ref. 11, p. 1; Ref. 24, p. 1
SE-02	11/24/97	0 - 12"	Chrysene	21,000 (4100)	Ref. 18, pp. 1, 2, 10, 12; Ref. 11, p. 1; Ref. 24, p. 1
SE-02	11/24/97	0 - 12"	Dibenzofuran	14,000 (4100)	Ref. 18, pp. 1, 2, 10, 13; Ref. 11, p. 1; Ref. 24, p. 1
SE-02	11/24/97	0 - 12"	Fluorene	23,000 (4100)	Ref. 18, pp. 1, 2, 10, 13; Ref. 11, p. 1; Ref. 24, p. 1
SE-02	11/24/97	0 - 12"	Fluoranthene	79,000 (4100)	Ref. 18, pp. 1, 2, 10, 12; Ref. 11, p. 1; Ref. 24, p. 1
SE-02	11/24/97	0 - 12"	Phenanthrene	64,000 (4100)	Ref. 18, pp. 1, 2, 10, 14; Ref. 11, p. 1; Ref. 24, p. 1
SE-02	11/24/97	0 - 12"	Pyrene	55,000 (4100)	Ref. 18, pp. 1, 2, 10, 14; Ref. 11, p. 1; Ref. 24, p. 1

Attribution

The Garland Creosoting Company was a manufacturer of creosote-treated wood products. The Creosoting process produced K001 creosote waste, a listed hazardous waste, that remains in the surface impoundments (Ref. 5, p. 1; Ref. 7, pp. 1, 3, 4).

Five of the six surface impoundments at the site were used for the evaporation of wood preserving wastewater. These impoundments contained K001 bottom sediment sludges from the treatment of the wastewater (Ref. 5, p. 1). The remaining surface impoundment was used as a containment pond in the event of a spill from the process area and wastewater treatment plant (Ref. 4, p. 3).

The Garland Creosoting Company implemented closure proceedings for five of the six surface impoundments. Surface impoundments 2, 3, 4, 5, and 6 were certified closed as of November 1989

(Ref. 7, p. 3; Ref. 6, p. 21). The K001 creosote sludges and contaminated soil residuals remained in the impoundments (Ref. 7, pp. 1, 3, 4).

A subsurface investigation indicated that a release had occurred from the surface impoundments resulting in ground water contamination. Twelve monitoring wells were installed onsite (Ref. 3, p. 3). Free-phase product, believed to be creosote, has been identified in five of the wells at thicknesses up to 0.3 feet (Ref. 25, pp. 5-7). Naphthalene, phenol, and chlorophenol were detected in monitoring wells MW-8 and MW-10 during the April 1993 ground water sampling event (Ref. 26, pp. 2, 3). Naphthalene, dibenzofuran, fluorene, and phenanthrene were detected in monitoring well MW-8D during the May 1994 ground water sampling event (Ref. 3, p. 3).

A ground water recovery trench was installed at the facility to intercept the plume of dissolved and free-phase creosote constituents. From the period of January 1993 through June 1993, the ground water recovery system has been recovering up to 250 gallons of creosote per month from the Queen City Aquifer, (Ref. 3, p. 2; Ref. 26, p. 4). However, the system ceased operation when the Garland Creosoting Company filed for bankruptcy in February 1997 (Ref. 6, p. 4).

During a 13 May 1997 TNRCC inspection, water with a sheen was observed flowing from a sump associated with the recovery system downgradient to the intermittent creek (Ref. 6, p. 4; Ref. 8, p. 1). The recovery sump is located approximately 60 feet north of the intermittent creek, which flows through the southwestern corner of the site (Ref. 8, p. 1).

The floor of the process building was also observed as being partially covered in water during this inspection. The water was flowing out of the building, through the wastewater treatment plant and surface impoundment 1, and towards the intermittent creek (Ref. 6, p. 14). Dark staining was noted on the ground in several locations and stressed vegetation was observed in locations downgradient from the surface impoundment and along the drainage pathway (Ref. 8, p. 1).

During a 30 May 1997 site visit, the TNRCC noted an area of soil saturated with creosote compounds from the sump to the edge of the intermittent creek. The area of saturated soil was approximately 1,400 square feet in size. Additionally, active creosote seeps were noted for approximately 100 yards along the banks of the intermittent creek (Ref. 13, p. 1). Sediment sample SE-04 was collected from the intermittent creek, immediately south of the sump (Ref. 18, pp. 1, 2, 24). Sediment sample SE-05 was collected onsite, between the sump and the intermittent creek (Ref. 18, pp. 1, 2, 31). A duplicate sediment sample (SE-06) was also collected from sample location SE-05 (Ref. 18, pp. 1, 2, 38). Sediment samples indicate migration of contaminants from the source to the intermittent creek as shown on Figure A-3 of Attachment A.

Based on sampling data, the presence of PAHs, halogenated phenols, and other organic compounds has been documented within source(s) at the site and within a perennial surface water body that drains the site (Ref. 10, pp. 1-8; Ref. 18, pp. 1-51). Further, a plume of contaminated ground water has been identified beneath the six surface impoundments at the site (Ref. 6, p. 21). Contaminants identified within the plume include PAHs, halogenated phenols, and other organic compounds (Ref. 3, pp. 2-3).

The compounds present in the various source and sediment samples collected from the site are known to be commonly associated with creosote constituents (Ref. 12, pp. 8-9). A table listing those compounds commonly found at creosote facilities is presented on page 19 of this documentation record.

Potential to Release

According to the HRS Rule, potential to release is evaluated only if an observed release cannot be established for the watershed of concern (Ref. 1, Subsec. 4.1.2.1.2). As such, the potential to release section for the surface water pathway was not evaluated because an observed release has been documented at the Garland Creosoting Site.

4.1.3.2 Human Food Chain Threat - Waste Characteristics

Specific factors related to waste characteristics associated with Source 1 (Surface Impoundments 1 through 6 and Sump) are presented in Section 2.2 of this documentation record. According to the HRS Rule, a combined toxicity/persistence/bioaccumulation factor value is determined for the hazardous substances for the human food chain threat (Ref. 1, Sec. 2.4.1.2). As such, a discussion of each separate factor value is presented in the subsections below. Factor values for toxicity, persistence, and bioaccumulation have been presented in Table III below as well as the appropriate calculations for the Human Food Chain Threat.

TABLE III

SUBSTANCE	TOX.	PERSIS. (RIVER)	BIOACCUM. (HUMAN FOOD CHAIN)*	TOX./PERSISTENCE FACTOR VALUE	TOX./PERSIS./BIOACCUM. FACTOR VALUE
Acenaphthene	10	0.400	500	4	2,000
Anthracene	10	1	5,000	10	50,000
Benzo(a)anthracene	1,000	1	50,000	1,000	5×10^7
Benzo(a)pyrene	10,000	1	50,000	10,000	5×10^8
Benzo(b,k)fluoranthene	100	1	50,000	100	5×10^6
Benzo(g,h,i)perylene	---	1	50,000	---	----
Chrysene	10	1	500	10	5,000
Cresol, m- †	10	1	5	10	50
Cresol, o-†	10	1	5	10	50

SUBSTANCE	TOX.	PERSIS. (RIVER)	BIOACCUM. (HUMAN FOOD CHAIN)*	TOX./PERSISTENCE FACTOR VALUE	TOX./PERSIS./BIOACCUM. FACTOR VALUE
Cresol, p-†	100	0.400	5	4	20
Dibenzofuran	---	1	500	---	---
Dibenzo(a,h)anthracene	10,000	1	50,000	10,000	5 x 10^8
2,4-Dimethlyphenol	100	1	500	100	50,000
Fluoranthene	100	1	5,000	100	500,000
Fluorene	100	1	5,000	100	500,000
Indenol(1,2,3-cd) pyrene	1,000	1	50,000	1,000	5 x 10^7
Naphthalene	100	0.400	500	40	20,000
Phenanthrene	---	1	50	---	---
Phenol	1	1	5	1	5
Pyrene	100	1	50	100	5,000

* The Bioaccumulation Factor Values (Human Food Chain) are those values for fresh water (Ref. 2).
† The type of cresols detected in the source samples PS1 and SS1 was not specified.

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

4.1.3.2.1.1 Toxicity

According to the HRS Rule, toxicity is evaluated for those hazardous substances at the site that are available to the pathway being scored (Ref. 1, Subsec. 2.4.1.1). Toxicity values for hazardous substances are assigned in the Superfund Chemical Data Matrix (SCDM) and presented in Table III (Ref. 2). As presented in Table III, benzo(a)pyrene was selected since it has the highest toxicity value (10,000) of the substances being evaluated (Ref. 2).

Toxicity: 10,000

4.1.3.2.1.2 Persistence

According to the HRS Rule, a persistence factor value is assigned to each hazardous substance based primarily on the half-life of the hazardous substance in surface water and secondarily on the sorption of the hazardous substance to sediments (Ref. 1, Subsec. 4.1.2.2.1.2). Persistence values for hazardous substances are assigned in SCDM (Ref. 2). As presented in Table III, the persistence factor value for benzo(a)pyrene is 1 (Ref. 2).

Persistence Factor Value: 1

4.1.3.2.1.3 Bioaccumulation Potential

The bioaccumulation potential factor value (food chain - fresh) reflects the tendency for a substance to accumulate in the tissue of an aquatic organism. The greater the bioaccumulation potential factor value, the greater the relative tendency of a substance to accumulate (Ref. 17, p. 7). Bioaccumulation potential factor values for hazardous substances are assigned in SCDM (Ref. 2). As presented in Table III, the bioaccumulation potential factor value for benzo(a)pyrene is 50,000 (Ref. 2).

Bioaccumulation Potential Factor Value: 50,000

4.1.3.2.1.4 Calculation of Toxicity/Persistence/Bioaccumulation Factor Value

According to the HRS Rule, a toxicity/persistence factor value is assigned per Table 4-12 based on the values assigned to the hazardous substance for the toxicity and persistence factors (Ref. 1, Subsec. 4.1.3.2.1.4). Based on a toxicity factor of 10,000 and a persistence factor of 1, a toxicity/persistence factor value of 10,000 was assigned per Table 4-12 (Ref. 1, Subsec. 4.1.3.2.1.4, Table 4-12).

According to the HRS Rule, a toxicity/persistence/bioaccumulation factor value is assigned per Table 4-16 based on the values assigned for the toxicity/persistence and bioaccumulation potential factors (Ref. 1, Subsec. 4.1.3.2.1.4; Ref. 2). Based on a toxicity/persistence factor value of 10,000 and a bioaccumulation factor of 50,000 for benzo(a)pyrene, a toxicity/persistence/bioaccumulation factor value of 5×10^8 is assigned for the watershed per Table 4-16 (Ref. 1, Subsec. 4.1.3.2.1.4, Table 4-16).

Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

4.1.3.2.2 Hazardous Waste Quantity

Specific information relating to the hazardous waste quantity for a watershed is presented in Section 2.4.2 of this documentation record. A source hazardous waste quantity value of 3,384.6 was used to calculate the hazardous waste quantity factor value from Table 2-6 of the HRS Rule (Ref. 1, Subsec. 2.4.2.2, Table 2-6). Based on Table 2-6 of the HRS Rule, a hazardous waste quantity factor value of 100 was assigned.

Hazardous Waste Quantity Factor Value: 100

4.1.3.2.3 Calculation of Human Food Chain Threat - Waste Characteristics Factor Category Value

According to the HRS Rule, the waste characteristics factor category is evaluated for the watershed based on its toxicity/persistence factor value and bioaccumulation potential factor value (Ref. 1, Subsec. 4.1.3.2.3). Based on the product of the toxicity/persistence factor value (10,000) and the hazardous waste quantity factor value (100) multiplied by the bioaccumulation potential factor value (50,000), the waste characteristics factor category value is 5 x 10^{10} (Ref. 1, Subsec. 4.1.3.2.3; Ref. 2). Based on this value, a value is selected from Table 2-7 of the HRS as the human food chain threat - waste characteristics factor category value for the watershed being evaluated. As such, a value of 320 is assigned (Ref. 1, Sec. 4.1.3.2.3, Table 2-7).

Human Food Chain Threat - Waste Characteristics Factor Category Value: 320

4.1.3.3 Human Food Chain Threat - Targets

According to the HRS Rule, target factors for each watershed of concern are evaluated: food chain individual and population (Ref. 1, Subsec. 4.1.3.3). Fisheries have been documented to be present within the 15-mile TDL (Ref. 19, p. 1). These fisheries are considered to be subject to actual contamination since there is evidence of contamination in the fishery by hazardous substances attributable to the site. Further, one or more of these hazardous substances have a bioaccumulation potential factor value (BPFV) of 500 or greater that meets the criteria for an observed release. The BPFVs for substances being evaluated for the human food chain threat are presented in Table III on page 35 and 36 of this documentation record. However, these fisheries do not lie wholly within the boundaries of the observed release; therefore, only the portion of the fisheries that lie within the boundaries of the observed release will be considered subject to actual contamination (see Figure A-4). The remainder of the fisheries within the 15-mile TDL will be considered subject to potential contamination (Ref. 1, Subsec. 4.1.3.3).

According to the Texas Parks and Wildlife Department, considerable fishing occurs in both Iron Bridge Creek and the Sabine River. Species fished from both bodies of water include flathead catfish, blue catfish, white bass, channel catfish, crappie, large mouth bass, and spotted bass (Ref. 19, p. 1). According to the Texas Parks and Wildlife Department, fish are primarily caught for human consumption (Ref. 19, p. 1).

4.1.3.3.1 Food Chain Individual

Based on analytical results of sediment samples SE-01 and SE-02, Level II concentrations have been documented within the Iron Bridge Creek (Ref. 18, pp. 1-3, 5, 7, 10, 12). Sediment sample SE-01 was collected approximately 660 feet downstream of the PPE, within Iron Bridge Creek (Ref. 18, p. 3). Sediment sample SE-02 was collected at the PPE (the confluence of the intermittent creek and Iron Bridge Creek) (Ref. 18, p. 10). As such, a value of 45 has been assigned since a fishery (or a portion of a fishery) within the 15-mile TDL is subject to Level II concentrations (Ref. 1, Subsec. 4.1.3.3.1; Ref. 19, p. 1).

Food Chain Individual: 45

4.1.3.3.2 Population

4.1.3.3.2.1 Level I Concentrations

Tissue samples from an essentially sessile, benthic, human food chain organism from the watershed being evaluated have not been collected. Therefore, Level I concentrations for a fishery have not been established (Ref. 1, pp. 51557-51558).

Level I Concentration Factor Value: 0

4.1.3.3.2.2 Level II Concentrations

According to the Texas Parks and Wildlife Department, both the Iron Bridge Creek and the Sabine River are considered fisheries (Ref. 19, p. 1). Analytical results for sediment samples SE-01 and SE-02 displayed concentrations of hazardous substances meeting observed release criteria and having a BPFV of 500 or greater (Ref. 1, Sec. 2.3; Ref. 2; Ref. 18, pp. 1-3, 5, 10, 12). Sediment sample SE-02 was collected at the PPE and sediment sample SE-01 was collected approximately 660 feet downstream of the PPE (Ref. 4, pp. 20, 25; Ref. 18, pp. 3, 10). Thus, approximately 660 feet (0.125 mile) of the Iron Bridge Creek (from the PPE to the location of sediment sample SE-01) will be considered a fishery subject to Level II concentrations. Presented in the table below are sediment samples displaying Level II concentrations. Specific sediment sample locations are depicted on Figure A-3 and Figure A-4 of Attachment A.

LEVEL II CONCENTRATIONS

SUBSTANCE	SAMPLE ID	CONCENTRATION (DL or PQL) (µg/kg)	BPFV [1]	REFERENCES
Acenaphthene	SE-02	23,000 (4100)	500	Ref. 2; Ref. 18, pp. 1, 2, 12; Ref. 24, p. 1
Anthracene	SE-02	10,000 (4100)	5,000	Ref. 2; Ref. 18, pp. 1, 2, 12; Ref. 24, p. 1
Benzo(a)anthracene	SE-02	22,000 (4100)	50,000	Ref. 2; Ref. 18, pp. 1, 2, 12; Ref. 24, p. 1

Note:

1 Value assigned based on Bioaccumulation Factors (human food chain - fresh water) presented in SCDM (Ref. 2).

SUBSTANCE	SAMPLE ID	CONCENTRATION (DL or PQL) (µg/kg)	BPFV [1]	REFERENCES
Benzo(a)pyrene	SE-02	6,600 (4100)	50,000	Ref. 2; Ref. 18, pp. 1, 2, 12; Ref. 24, p. 1
Benzo(b,k)fluoranthene	SE-02	19,300 (8200)	50,000	Ref. 2; Ref. 18, pp. 1, 2, 12; Ref. 24, p. 1
Chrysene	SE-02	21,000 (4100)	500	Ref. 2; Ref. 18, pp. 1, 2, 12; Ref. 24, p. 1
Dibenzofuran	SE-02	14,000 (4100)	500	Ref. 2; Ref. 18, pp. 1, 2, 13; Ref. 24, p. 1
Fluoranthene	SE-01	1,300 (730)	5,000	Ref. 2; Ref. 18, pp. 1, 2, 5, 12; Ref. 24, p. 1
	SE-02	79,000 (4100)		
Fluorene	SE-02	23,000 (4100)	5,000	Ref. 2; Ref. 18, pp. 1, 2, 13; Ref. 24, p. 1
Pyrene	SE-01	900 (730)	50	Ref. 2; Ref. 18, pp. 1, 2, 7, 14; Ref. 24, p. 1
	SE-02	55,000 (4100)		

Note:

1 Value assigned based on Bioaccumulation Factors (human food chain - fresh water) presented in SCDM (Ref. 2).

According to the HRS Rule, a value for the human food chain population is assigned from Table 4-18 of the HRS Rule based on the estimated human food chain production for the fishery (Ref. 1, Subsec. 4.1.3.3.2.2, Table 4-18). Presented in the table below is the estimated human food chain production for the fishery located within Iron Bridge Creek. According to the Texas Parks and Wildlife Department, peak fishing within the Iron Bridge Creek occurs from December through the end of the summer (Ref. 19, p. 1). The Texas Parks and Wildlife Department was not able to estimate the annual production for Iron Bridge Creek, therefore, a food chain production of greater than zero to 100 pounds per year has been assigned to this portion of Iron Bridge Creek (Ref. 1, Subsec. 4.1.3.3.2.2). It should be noted that fish are primarily caught from the Iron Bridge Creek for human consumption (Ref. 19, p. 1).

LEVEL II FISHERIES

FISHERY	ANNUAL PRODUCTION (POUNDS)	HUMAN FOOD CHAIN POPULATION FACTOR VALUE [1]	REFERENCES
Iron Bridge Creek	> 0	0.03	Ref. 1, Subsec. 4.1.3.3.2.2, Table 4-18; Ref. 19, p. 1

Note:

1 Value assigned from Table 4-18 of the HRS Rule (Ref. 1).

Based on an estimated human food chain production of greater than zero (> 0) pounds per year, a human food chain population factor value of 0.03 is assigned per Table 4-18 of the HRS Rule (Ref. 1, Subsec. 4.1.3.3.2.2, Table 4-18). The Level II concentrations factor value is calculated by summing the human food chain population value for each fishery (or a portion of a fishery). If this sum is less than 1, do not round to the nearest integer. If it is 1 or more, round it to the nearest integer (Ref. 1, Subsec. 4.1.3.3.2.2). As such, the value of 0.03 will be assigned as the Level II concentrations factor value.

Level II Concentrations Factor Value: 0.03

4.1.3.3.2.3 Potential Human Food Chain Contamination

The remaining portion of the Iron Bridge Creek (1.625 miles) and approximately 13.25 miles of the Sabine River are considered to be fisheries subject to potential contamination. According to the Texas Parks and Wildlife Department, the Sabine River is fished considerably for human consumption purposes (Ref. 19, p. 1). Species fished include flathead catfish, blue catfish, white bass, channel catfish, crappie, largemouth bass, and spotted bass (Ref. 19, p. 1). However, evaluation of these fisheries subject to potential contamination will not significantly affect the overall site score.

4.1.3.3.2.4 Calculation of Population Factor Value

According to the HRS Rule, the population factor value is calculated by summing the values for Level I concentrations, Level II concentrations, and potential human food chain contamination factors for the watershed being evaluated, without rounding this sum to the nearest integer (Ref. 1, Subsec. 4.1.3.3.2.4). As such, 0.03 is assigned as the population factor value.

Population Factor Value: 0.03

4.1.3.3.3 Calculation of Human Food Chain Threat - Targets Factor Category Value

According to the HRS Rule, the human food chain threat - targets factor category value is calculated by summing the food chain individual (45) and population factor values (0.03) for the watershed being evaluated (Ref. 1, Subsec. 4.1.3.3.3). As such, a value of 45.03 is assigned as the human food chain threat - targets factor category value.

Human Food Chain Threat - Targets Factor Category Value: 45.03

4.1.3.4 Calculation of Human Food Chain Threat Score for a Watershed

According to the HRS Rule, the human food chain threat score for the watershed being evaluated is calculated by multiplying the human food chain threat factor category values for likelihood of release, waste characteristics, and targets for the watershed. This product is rounded to the nearest integer and divided by 82,500 (Ref. 1, Subsec. 4.1.3.4). This resulting value, subject to a maximum of 100, is assigned as the human food chain threat score for a watershed (Ref. 1, Subsec. 4.1.3.4). Thus, 550 x 320 x 45.03/82,500 yields a value of 96.06. As such, the value of 96.06 is assigned as the human food chain threat score for the watershed being evaluated.

Human Food Chain Threat Score for a Watershed: 96.06

4.1.4 <u>Environmental Threat</u>

According to the HRS Rule, the environmental threat is evaluated based on the Likelihood of Release, Waste Characteristics, and Targets (Ref. 1, Subsec. 4.1.4).

4.1.4.1 Environmental Threat - Likelihood of Release

Specific information related to sediment samples that meet the criteria for an observed release for the environmental threat are presented in Table II of this documentation record.

4.1.4.2 Environmental Threat - Waste Characteristics

Specific factors related to waste characteristics associated with Source 1 (Surface Impoundments 1 through 6 and Sump) are presented in Section 2.2 of this documentation record. According to the HRS Rule, a combined ecosystem toxicity/persistence/bioaccumulation factor value is determined for the hazardous substances for the environmental threat (Ref. 1, Sec. 2.4.1.2). As such, a discussion of each separate factor value is presented in the subsections below. Factor values for ecosystem toxicity, persistence, and bioaccumulation have been presented in Table IV below as well as the appropriate calculations for the Environmental Threat.

TABLE IV

SUBSTANCE	ECO. TOX.†	PERSIS. (RIVER)	BIOACCUM. (ENVIRONMENTAL)*	TOX./PERSISTENCE FACTOR VALUE	TOX./PERSIS./BIOACCUM. FACTOR VALUE
Acenaphthene	10,000	0.400	500	4,000	2×10^6
Anthracene	10,000	1	5,000	10,000	5×10^7
Benzo(a)anthracene	10,000	1	50,000	10,000	5×10^8
Benzo(a)pyrene	10,000	1	50,000	10,000	5×10^8
Benzo(b,k)fluoranthene	---	1	50,000	---	---
Benzo(g,h,i)perylene	---	1	50,000	---	---
Chrysene	1,000	1	5,000	1,000	5×10^6
Cresols	100	1	5	100	500
Dibenzofuran	100	1	500	100	50,000
Dibenzo(a,h)anthracene	---	1	50,000	---	---
2,4-Dimethylphenol	100	1	500	100	50,000
Fluoranthene	10,000	1	500	10,000	5×10^6
Fluorene	1,000	1	5,000	1,000	5×10^6
Indenol(1,2,3-cd)pyrene	---	1	50,000	---	---
Naphthalene	1,000	0.400	500	400	200,000
Phenanthrene	1,000	1	5,000	1,000	5×10^6
Phenol	10,000	1	5	10,000	50,000
Pyrene	10,000	1	50	10,000	500,000

† The Ecotoxicity Factor Values are those values for fresh water (Ref. 2).
* The Bioaccumulation Factor Values (Environmental) are those values for fresh water (Ref. 2).

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

4.1.4.2.1.1 Ecosystem Toxicity

According to the HRS Rule, toxicity is evaluated for those hazardous substances at the site that are available to the pathway being scored (Ref. 1, Subsec. 2.4.1.1). Ecotoxicity values for hazardous substances are assigned in the Superfund Chemical Data Matrix (SCDM) and presented in Table IV (Ref. 2). As presented in Table IV, several substances have an ecotoxicity value of 10,000 (Ref. 2). These substances include acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, fluoranthene, phenol, and pyrene (Ref. 2).

Toxicity: 10,000

4.1.4.2.1.2 Persistence

According to the HRS Rule, a persistence factor value is assigned to each hazardous substance based primarily on the half-life of the hazardous substance in surface water and secondarily on the sorption of the hazardous substance to sediments (Ref. 1, Subsec. 4.1.4.2.1.2). Persistence values for hazardous substances are assigned in SCDM (Ref. 2). As presented in Table IV, the highest persistence factor value for the hazardous substances being evaluated is 1 (Ref. 2).

Persistence Factor Value: 1

4.1.4.2.1.3 Ecosystem Bioaccumulation Potential

The bioaccumulation potential factor value (environmental - fresh) reflects the tendency for a substance to accumulate in the tissue of an aquatic organism (Ref. 17, p. 7). The greater the bioaccumulation potential factor value, the greater the relative tendency of a substance to accumulate (Ref. 17, p. 7). Bioaccumulation potential factor values for hazardous substances are assigned in SCDM (Ref. 2). As presented in Table IV, the highest bioaccumulation potential factor value for the hazardous substances being evaluated is 50,000 (Ref. 2).

Bioaccumulation Potential Factor Value: 50,000

4.1.4.2.1.4 Calculation of Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value

According to the HRS Rule, an ecosystem toxicity/persistence factor value is assigned per Table 4-20 based on the values assigned to the hazardous substance for the ecosystem toxicity and persistence factors (Ref. 1, Subsec. 4.1.4.2.1.4). Based on a toxicity factor of 10,000 and a persistence factor of 1, a toxicity/persistence factor value of 10,000 was assigned per Table 4-20 (Ref. 1, Subsec. 4.1.4.2.1.4, Table 4-20).

According to the HRS Rule, an ecosystem toxicity/persistence/bioaccumulation factor value is assigned per Table 4-21 based on the values assigned for the ecosystem toxicity/persistence and ecosystem bioaccumulation potential factors (Ref. 1, Subsec. 4.1.4.2.1.4; Ref. 2). The hazardous substance with the highest value is assigned as the ecosystem toxicity/persistence/bioaccumulation factor value for the watershed (Ref. 1, Subsec. 4.1.4.2.1.4). Based on a toxicity/persistence factor value of 10,000 and a bioaccumulation factor of 50,000 for benzo(a)pyrene, a toxicity/persistence/bioaccumulation factor value of 5×10^8 is assigned for the watershed per Table 4-21 (Ref. 1, Subsec. 4.1.4.2.1.4, Table 4-21).

Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

4.1.4.2.2 Hazardous Waste Quantity

According to the HRS Rule, the same hazardous waste quantity factor value for the human food chain threat is assigned for the environmental threat for the watershed (Ref. 1, Sec. 4.1.4.2.2). As such, a hazardous waste quantity value of 100 is assigned.

Hazardous Waste Quantity: 100

4.1.4.2.3 Calculation of Environmental Threat - Waste Characteristics Factor Category Value

For the hazardous substance selected for the watershed in subsection 4.1.4.2.1.4 [benzo(a)pyrene], use its ecosystem toxicity/persistence factor value and ecosystem bioaccumulation potential factor value as follows to assign a value to the waste characteristics factor category (Ref. 1, Sec. 4.1.4.2.3).

First, multiply the ecosystem toxicity/persistence factor value and the hazardous waste quantity factor value for the watershed, subject to a maximum product of 1×10^8. Then multiply this product by the ecosystem bioaccumulation potential factor value for this hazardous substance, subject to a maximum product of 1×10^{12}. Based on this second product, assign a value from Table 2-7 to the environmental threat - waste characteristics factor category for the watershed (Ref. 1, Sec. 4.1.4.2.3).

Calculation: $10{,}000 \times 100 = 1{,}000{,}000\ (1 \times 10^6)$

$1{,}000{,}000 \times 50{,}000 = 5 \times 10^{10}$

Thus, based on a product of 5×10^{10}, a value from Table 2-7 is assigned as the environmental threat - waste characteristics factor category value for the watershed being evaluated (Ref. 1, Table 2-7).

Environmental Threat - Waste Characteristics Factor Category Value: 320

4.1.4.3 Environmental Threat - Targets

4.1.4.3.1 Sensitive Environments

Sensitive environments along the hazardous substance migration path for the watershed are evaluated based on three factors: Level I concentrations, Level II concentrations, and potential contamination. Ecological-based benchmarks are used instead of health-based benchmarks in determining the level of contamination in samples (Ref. 1, Sec. 4.1.4.3.1). The ecological-based benchmark values are the EPA's AWQC AND AALAC values (Ref. 17, p. 5).

A U.S. Fish and Wildlife National Wetlands Inventory (NWI) map was reviewed in order to identify wetland areas along the surface water pathway. According to the NWI map, HRS-eligible wetlands have been identified throughout the 15-mile TDL of the surface water pathway (Ref. 16, p. 1). Wetlands subject to actual contamination have not been identified for the surface water pathway. According to a representative with the U.S. Fish and Wildlife Service, there are no definitive wetlands present from the PPE to the location of sediment sample SE-01, which is the farthest sampling point downstream (Ref. 28, p. 1).

4.1.4.3.1.1 Level I Concentrations

According to the HRS Rule, a value from Table 4-23 of the HRS Rule is assigned to each sensitive environment subject to Level I concentrations. For those sensitive environments that are wetlands, an additional value from Table 4-24 of the HRS Rule is assigned (Ref. 1, Sec. 4.1.4.3.1.1).

None of the hazardous substances detected in the sediment samples collected from the PPE and the Iron Bridge Creek have applicable ecological-based benchmarks. As such, these samples are not representative of Level I concentrations, therefore, these sample locations will be considered subject to Level II concentrations (Ref. 17, p. 5). Surface water samples can be used to establish both Level I and Level II concentrations; sediment samples can be used only to establish Level II concentrations (Ref. 17, p. 6).

Level I Concentrations Factor Value: 0

4.1.4.3.1.2 Level II Concentrations

According to the HRS Rule, a value from Table 4-23 of the HRS Rule is assigned to each sensitive environment subject to Level II concentrations. For those sensitive environments that are wetlands, an additional value from Table 4-24 of the HRS Rule is assigned (Ref. 1, Sec. 4.1.4.3.1.2).

No sensitive environments or HRS-eligible wetlands subject to Level II concentrations have been identified for the Garland Creosoting Site.

Level II Concentrations Factor Value: 0

4.1.4.3.1.3 Potential Contamination

According to the NWI map, approximately 31.83 miles of HRS-eligible wetlands frontage occur within the 15-mile TDL and are subject to potential contamination. The wetlands frontage subject to potential contamination begins approximately 0.5 miles downstream of the PPE within Iron Bridge Creek and continues along Iron Bridge Creek and the Sabine River to the end of the 15-mile TDL (Ref. 16, p. 1; Ref. 18, pp. 1-3; Ref. 28, p. 1). Evaluation of potential wetland targets within the 15-mile TDL is presented below.

WETLAND	SEGMENT	TYPE	FRONTAGE (MILES)	REFERENCES
PSS1A	Iron Bridge Creek	Palustrine Scrub/Shrub Broad-leaved Deciduous	0.28	Ref. 16, p. 1
PEM5A	Iron Bridge Creek	Palustrine Emergent Narrow-leaved Persistent	0.38	Ref. 16, p. 1
PSS/EM5C	Iron Bridge Creek	Palustrine Scrub/Shrub and Palustrine Emergent	0.45	Ref. 16, p. 1
PSS1C	Iron Bridge Creek	Palustrine Scrub/Shrub Broad-leaved Deciduous	0.38	Ref. 16, p. 1
POWH	Sabine River	Palustrine Open Water Permanent	0.25	Ref. 16, p. 1
R20WH	Sabine River	Riverine Lower Perennial Open Water; within the river	26.5	Ref. 16, p. 1
PF01A	Sabine River	Palustrine Forested Broad-leaved Deciduous	3.5 *	Ref. 16, p. 1
PSS1C	Sabine River	Palustrine Scrub/Shrub Broad-leaved Deciduous	0.09†	Ref. 16, p. 1

* This mileage is the total of various segments of PF01A wetlands measured along the banks of the Sabine River.
† This mileage is one segment of PSS1C wetlands measured along the bank of the Sabine River.

The total length of wetlands frontage subject to potential contamination for Iron Bridge Creek is 1.49 miles (Ref. 16, p. 1). The total length of wetlands frontage subject to potential contamination for the Sabine River is 30.34 miles (Ref. 16, p. 1). A wetlands rating value from the HRS Table 4-24 is assigned based on the total length of wetland frontage for each surface water body segment within the 15-mile TDL (Ref. 1, Sec. 4.1.4.3.1.3, Table 4-24).

A wetlands rating value of 50 is assigned for Iron Bridge Creek (Ref. 1, Table 4-24). A wetlands rating value of 500 is assigned for the Sabine River (Ref. 1, Table 4-24). Flow characteristics for the Iron Bridge Creek were not available, but it is known to be smaller than the Sabine River; therefore, from HRS Table 4-13, a dilution weight of 0.1 is assigned to the Iron Bridge Creek (small to moderate stream) (Ref. 1, Table 4-13). The Sabine River is considered to be a moderate to large stream with flow characteristics ranging between 50 to 500 cubic feet per second (cfs) (Ref. 27, p. 3). A dilution weight of 0.01 is assigned to the Sabine River based on its categorization as a moderate to large stream (Ref. 1, Table 4-13).

The paddlefish has been identified as a listed endangered species for the State of Texas. The paddlefish is part of an aggressive restocking program by the Texas Parks and Wildlife Department. The paddlefish is restocked at various locations along the Sabine River, including the City of Gladewater and where State Highway 149 crosses the Sabine River. State Highway 149 crosses the Sabine River approximately 2 miles south of the site within the 15 mile TDL (Ref. 16, p. 1; Ref. 20, p. 1; Ref. 21, pp. 4, 6). Therefore, a sensitive environments rating value of 50 is assigned from Table 4-23 for a habitat known to be used by State designated endangered species (Ref. 1, Sec. 4.1.4.3.1.3, Table 4-23).

Sensitive Environments Rating Value: 50

The sum of the wetlands rating value and the sensitive environments rating value for each surface water body is then multiplied by the appropriate dilution weight. As such, the calculations are as follows:

Iron Bridge Creek:	50 x 0.1	=	5
Sabine River:	(500 + 50) x 0.01	=	5.5

These two products are summed, then divided by ten and the result is assigned as the potential contamination value for the wetlands (Ref. 1, sec. 4.1.4.3.1.3).

(5 + 5.5) / 10 = 1.05

If the potential contamination factor value is 1 or more, it is rounded to the nearest integer (Ref. 1, sec. 4.1.4.3.1.3). As such, a value of 1 is assigned as the Potential Contamination Value.

Potential Contamination Value: 1

4.1.4.4 Calculation of Environmental Threat Score for a Watershed

According to the HRS Rule, the environmental threat score for the watershed being evaluated is calculated by multiplying the environmental threat factor category values for likelihood of release, waste characteristics, and targets for the watershed and dividing by 82,500. The resulting value, subject to a maximum value of 60, is the environmental threat for the watershed (Ref. 1, Sec. 4.1.4.4).

Calculation: 550 x 320 x 1/82,500 = 2.13

Environmental Threat Score for a Watershed: 2.13

4.1.5 Calculation of Overland/Flood Migration Component Score for a Watershed

According to the HRS Rule, the overland/flood migration component score is calculated by summing the scores for the three threats (drinking water, human food chain, and environmental). The resulting score, subject to a maximum value of 100, is assigned as the overland/flood migration component score for the watershed being evaluated (Ref. 1, Subsec. 4.1.5).

Calculation: 0 + 96.06 + 2.13 = 98.19 (subject to a maximum value of 100)

Overland/Flood Migration Component Score for a Watershed: 98.19

4.1.6 Calculation of Overland/Flood Migration Component Score

According to the HRS Rule, the overland/flood migration component score is calculated by selecting the highest overland/flood migration component score from the watersheds evaluated (Ref. 1, Subsec. 4.1.6). Only one watershed was evaluated for the Garland Creosoting Site. As such, a value of 98.19 is assigned as the overland/flood migration component score.

Overland/Flood Migration Component Score: 98.19
Surface Water Overland/Flood Migration Component Score: 98.19

4.2 GROUND WATER TO SURFACE WATER MIGRATION COMPONENT

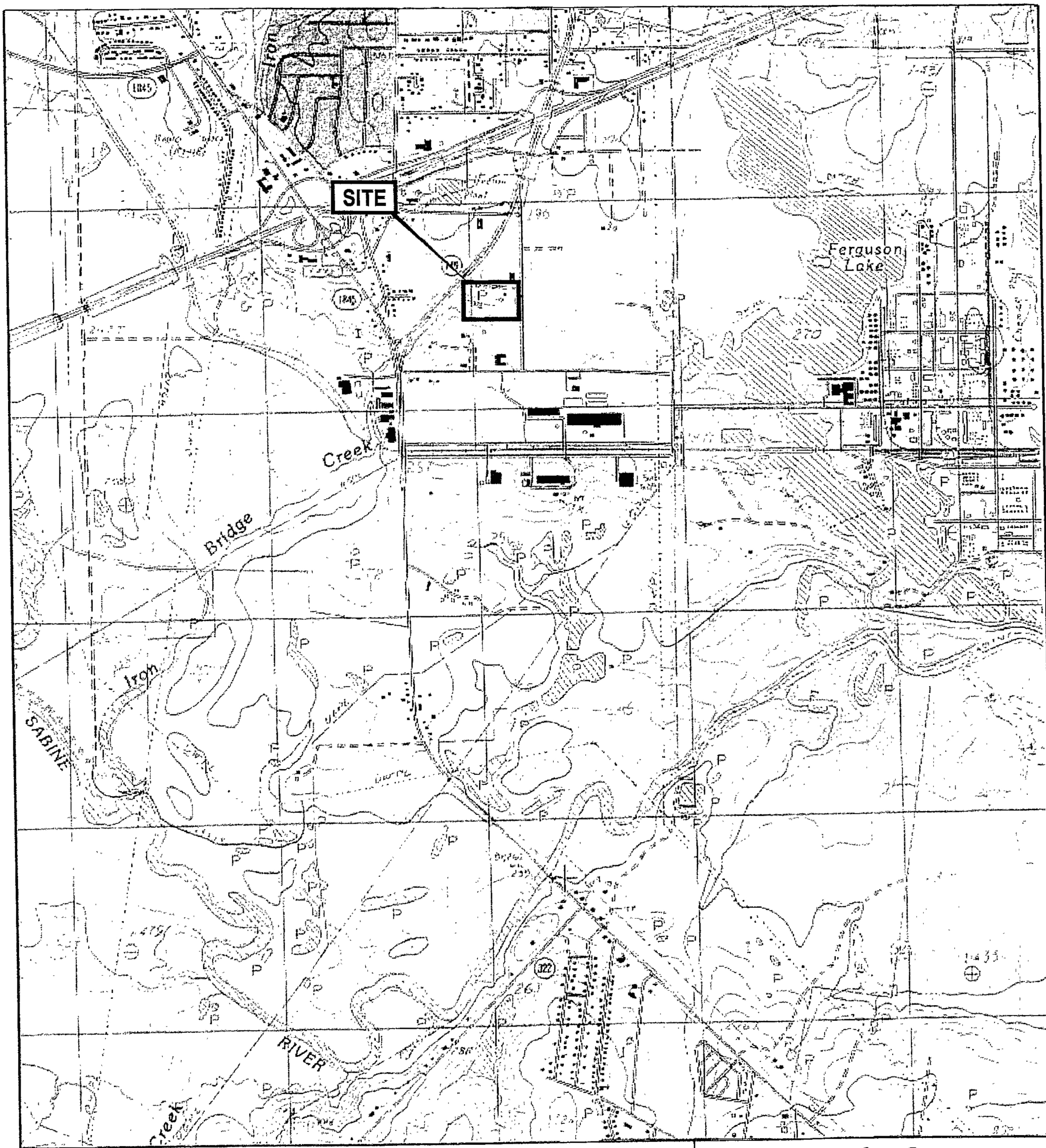
The ground water to surface water migration component was not evaluated for the Garland Creosoting site because the overland/flood migration component scored 98.19. It is unlikely that the ground water to surface water component would affect the site score.

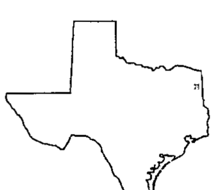
5.0 SOIL EXPOSURE PATHWAY

The soil exposure pathway was not evaluated for the Garland Creosoting Site as no residences, daycare centers, workers, or schools have been identified on or within 200 feet of any known contamination or potential source of contamination at the site (Ref. 1, Sec. 5.1). As such, evaluation of this pathway would not significantly affect the overall site score.

6.0 AIR PATHWAY

The air pathway was not evaluated for the Garland Creosoting Site as an observed release to the air pathway has not been documented. Further, there is no analytical evidence available to support a release. As such, evaluation of this pathway would not significantly affect the overall site score.





MAP PREPARED FROM:

U.S. DEPT. OF THE INTERIOR
GEOGRAPHICAL SURVEY

LAKEPORT QUADRANGLE
TEXAS
7.5 MINUTE SERIES (TOPOGRAPHIC)
1983 SERIES
SCALE 1:12,000

0 500 1000

SCALE IN FEET

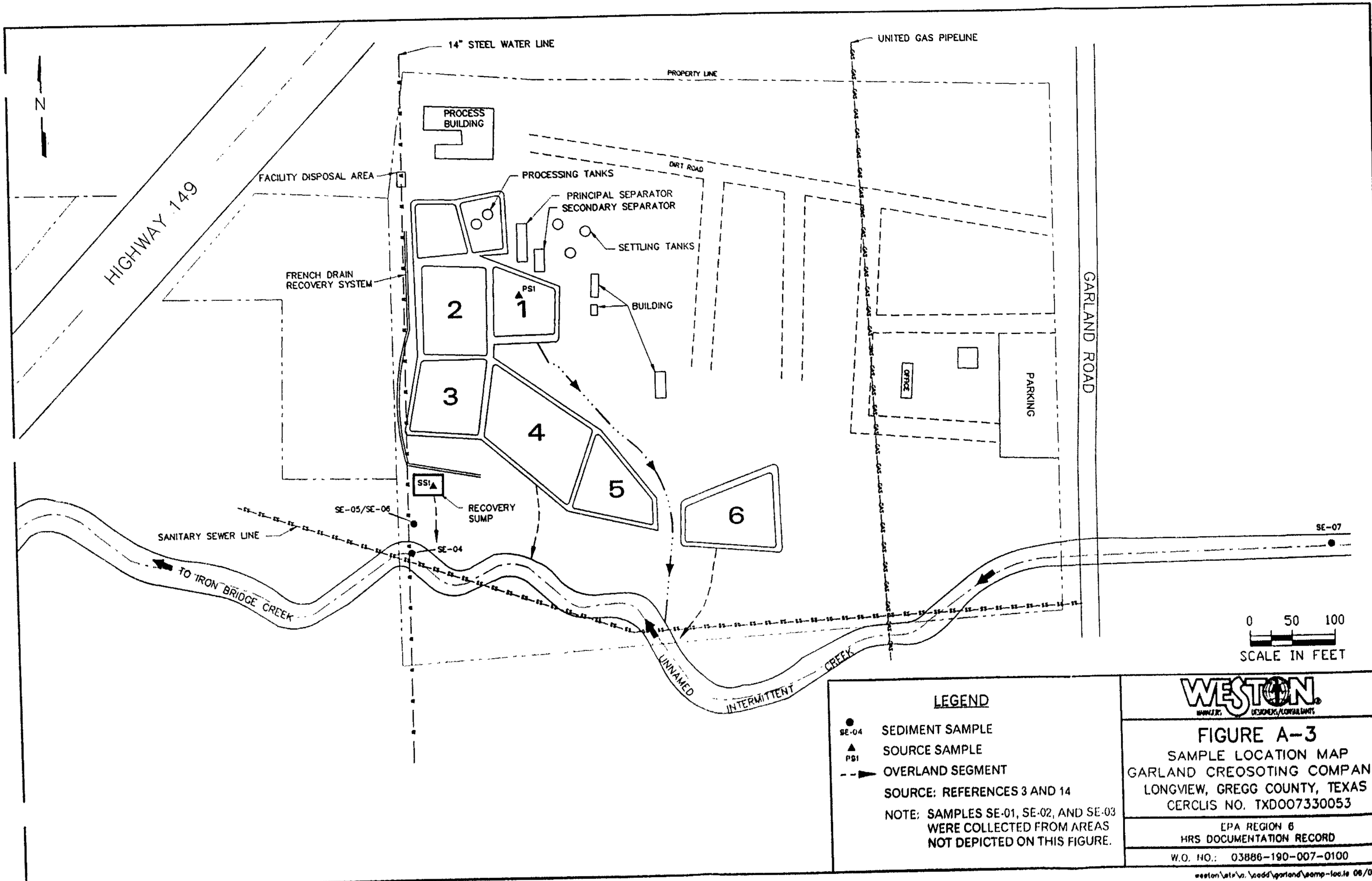
WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE A-2
SITE AREA MAP
GARLAND CREOSOTING COMPANY
LONGVIEW, TEXAS
CERLA ID. NO.: TXD007330053

EPA REGION 6
HRS DOCUMENTATION RECORD

W.O. NO. 03886-190-007-0200

weston\stx\k:\cadd\beaumont\site-map.ls 05-07-99



LEGEND

- ● SE-04 SEDIMENT SAMPLE
- ▲ PS1 SOURCE SAMPLE
- - -► OVERLAND SEGMENT

SOURCE: REFERENCES 3 AND 14

NOTE: SAMPLES SE-01, SE-02, AND SE-03 WERE COLLECTED FROM AREAS NOT DEPICTED ON THIS FIGURE.

WESTON MANAGERS DESIGNERS/CONSULTANTS

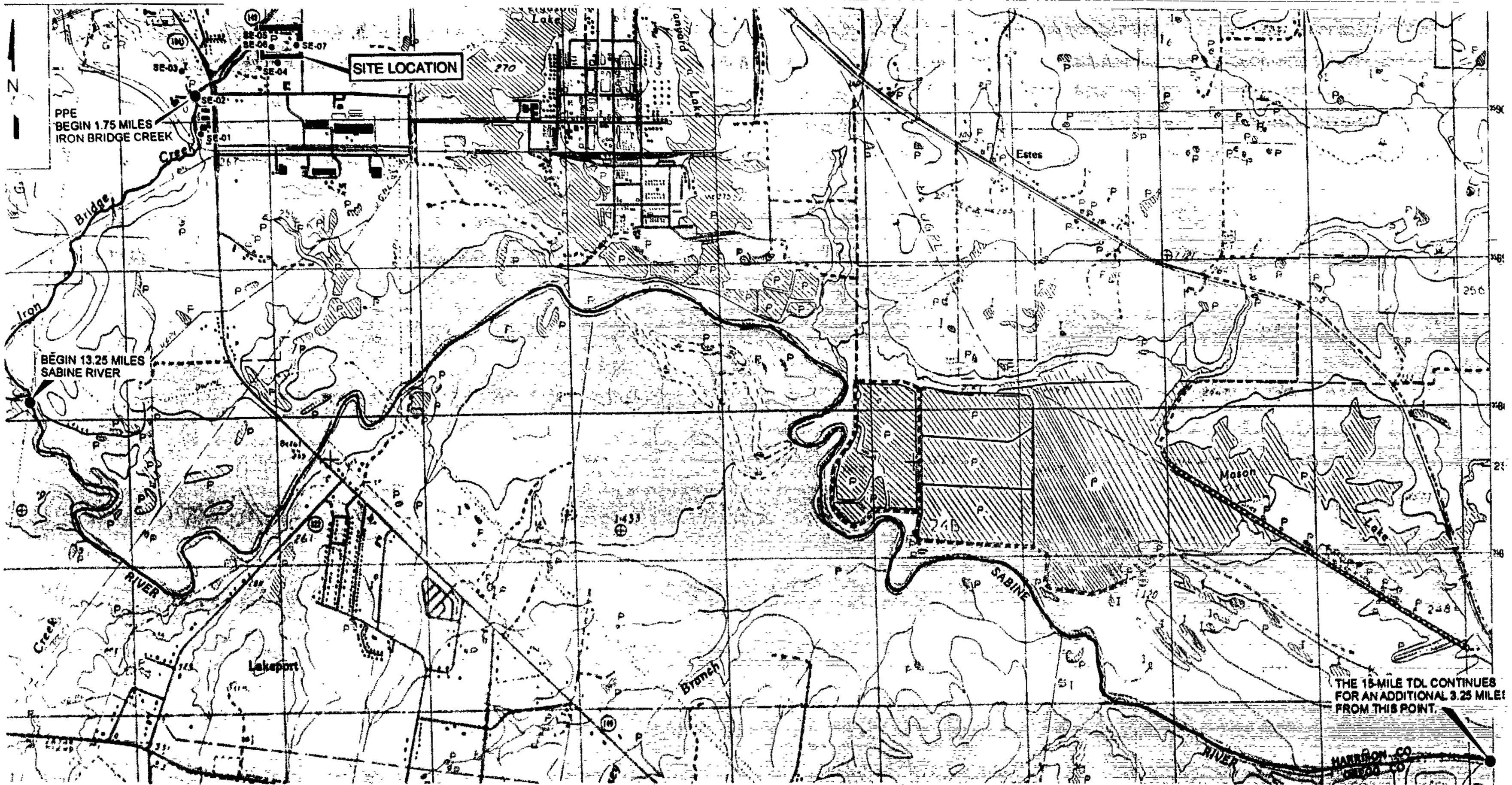
FIGURE A-3

SAMPLE LOCATION MAP
GARLAND CREOSOTING COMPANY
LONGVIEW, GREGG COUNTY, TEXAS
CERCLIS NO. TXD007330053

EPA REGION 6
HRS DOCUMENTATION RECORD

W.O. NO.: 03886-190-007-0100

weston\str\n.\cadd\garland\samp-loc.le 08/02/99



LEGEND

● SEDIMENT SAMPLE LOCATION

MAP PREPARED FROM:

SCALE 1:24,000

0 1000 2000

SCALE IN FEET

WESTON

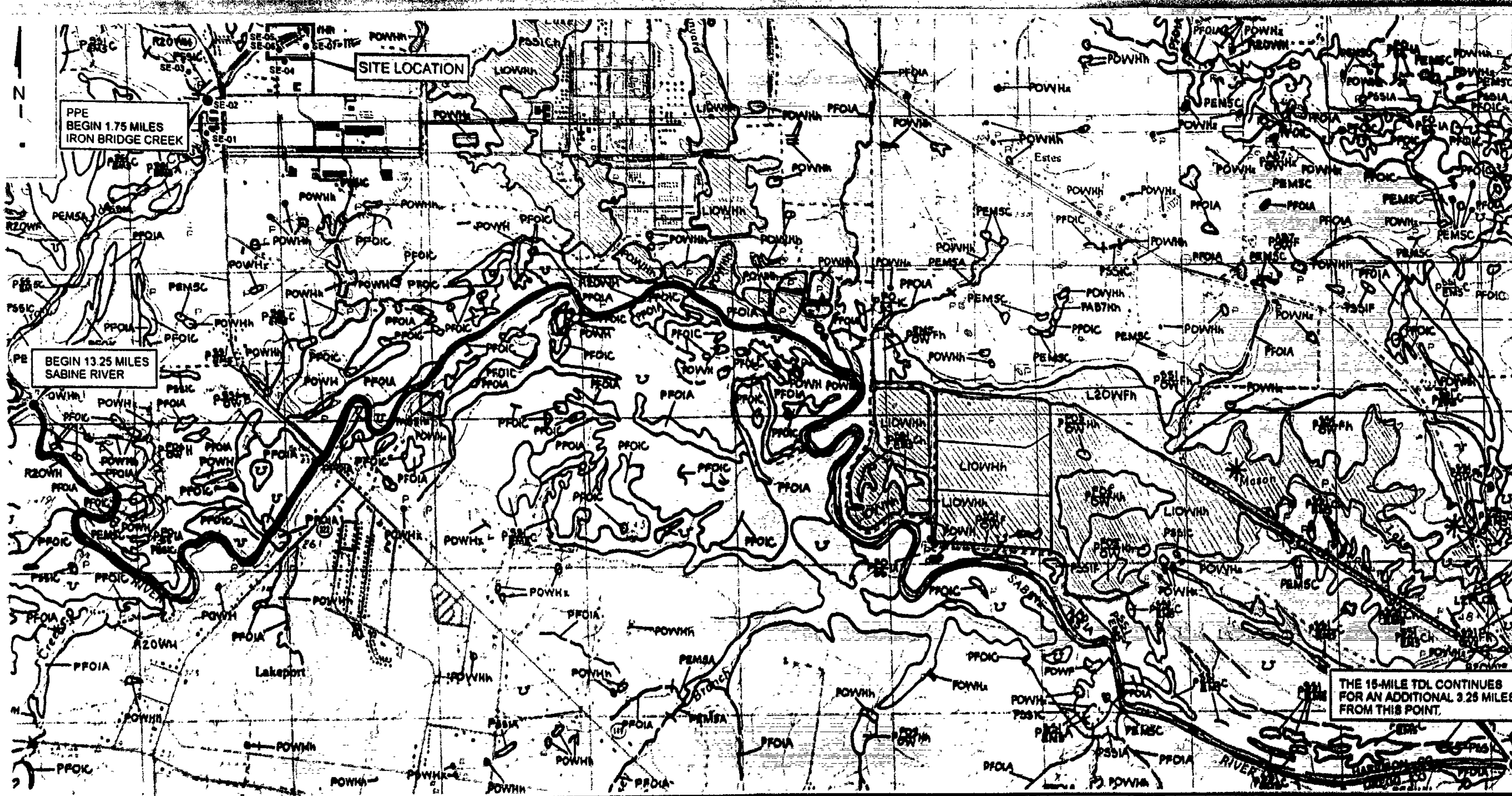
FIGURE A-4

SURFACE WATER PATHWAY MAP
GARLAND CREOSOTING COMPANY

LONGVIEW, TEXAS
CERCLA ID. NO.: TXD007330053

EPA REGION 6
HRS DOCUMENTATION RECORD

W.O. NO.: 02888-190-007-0800



LEGEND

● SEDIMENT SAMPLE LOCATION

SURFACE WATER PATHWAY

MAP PREPARED FROM:

NATIONAL WETLANDS INVENTORY MAP

SCALE 1:24,000

0 1000 2000

SCALE IN FEET

WESTON

FIGURE A-5

WETLANDS FRONTAGE MAP
GARLAND CREOSOTING COMPANY

LONGVIEW, TEXAS
CERCLA ID. NO.: TXD007330053

HRS DOCUMENTATION RECORD